



United States of America
Department of Transportation
Federal Aviation Administration

Supplemental Type Certificate

IMPORT

Number: SR02730NY

This certificate issued to: Aero Design Ltd.
9888A Malaspina Rd.
Powell River, BC
V8A 0G3 Canada

certifies that the change in the type design for the following product with the limitations and conditions therefore as specified hereon meets the airworthiness requirements of Part * of the Civil Air / Federal Aviation Regulations.

Original Product – Type Certificate Number: Make: *

* See attached FAA Approved Model List (AML) Model: *

No. SR02730NY for a list of approved models
and applicable regulations.

Description of Type Design Change:

1. Configuration A – Quick Release Mounting Provisions:
Installation of Quick Release Mounting Provisions in accordance with Aero Design Ltd. Document Control List, DCL751-4, Revision 0, dated January 13, 2015, TCCA approved February 6, 2015, or later TCCA approved revisions.
2. Configuration B – Quick Release Cargo Basket Installation: (Standard Basket)
Installation of Quick Release Cargo Basket in accordance with Aero Design Ltd. Document Control List, DCL751-1, Revision 2, dated January 13, 2015, TCCA approved February 6, 2015, or later approved revision.
(See Description of Type Design Change continued on Page 3 of 3)

Limitations and Conditions:

1. Installation of Configuration A or E is a prerequisite for the installation of Configurations B, C and D.
2. Installation of Configuration E is a prerequisite for the installation of Configuration F.
3. Configuration A and E may remain installed on aircraft when Configuration B, C, D or F are removed.
4. Configuration D is not approved for installation on Bell 212, 412EP, or 412CF.
5. Configuration F is not approved for installation on Bell 412, 412EP, or 412CF.

(See Limitations and Conditions continued on Page 3 of 3)

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, and revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of Application: March 19, 2009

Date Reissued: April 13, 2015

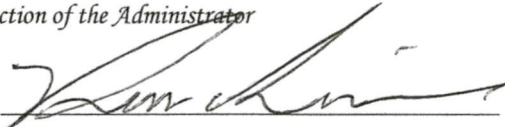
Date of Issuance: September 11, 2009

Date Amended: November 17, 2015

By Direction of the Administrator

Signature

Title


Raymond Reinhardt
Acting Manager
New York Aircraft Certification Office

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both. This certificate may be transferred or made available to third persons by licensing agreements in accordance with 14 CFR 21.47. Possession of this Supplemental Type Certificate (STC) document by persons other than the STC holder does not constitute rights to the design data nor to alter an aircraft, aircraft engine, or propeller. The STC's supporting documentation (drawings, instructions, specifications, flight manual supplements, etc.) is the property of the STC holder. An STC holder who allows a person to use the STC to alter an aircraft, aircraft engine, or propeller must provide that person with written permission acceptable to the FAA. (Ref. 14 CFR 21.120).



United States of America
Department of Transportation
Federal Aviation Administration
Supplemental Type Certificate

INSTRUCTIONS: The transfer endorsement below may be used to notify the appropriate FAA Aircraft Certification Office of the transfer of this Supplemental Type Certificate. The FAA will reissue the certificate in the name of the transferee and forward it to him.

Transfer Endorsement

Transfer the ownership of Supplemental Type Certificate Number: SR02730NY

To (Name and address of transferee)

From (Name and address of grantor)

Extent of Authority (if licensing agreement):

Date of transfer:

Signature of grantor: _____

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both. This certificate may be transferred or made available to third persons by licensing agreements in accordance with 14 CFR 21.47. Possession of this Supplemental Type Certificate (STC) document by persons other than the STC holder does not constitute rights to the design data nor to alter an aircraft, aircraft engine, or propeller. The STC's supporting documentation (drawings, instructions, specifications, flight manual supplements, etc.) is the property of the STC holder. An STC holder who allows a person to use the STC to alter an aircraft, aircraft engine, or propeller must provide that person with written permission acceptable to the FAA. (Ref. 14 CFR 21.120).



United States of America
Department of Transportation
Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number: SR02730NY

Date Reissued and Amended: November 17, 2015

Description of the Type Design Change (continued):

3. Configuration C – Quick Release Cabin Step Installation:
Installation of Quick Release Cabin Step in accordance with Aero Design Ltd. Document Control List, DCL800-1, Revision 1, dated January 13, 2015, TCCA approved February 6, 2015, or later approved revision.
4. Configuration D – Quick Release Cargo Basket: (Extra Large Basket)
Installation of Quick Release Cargo Basket in accordance with Aero Design Ltd. Document Control List, DCL955-3, Revision 0, dated January 13, 2015, TCCA approved February 6, 2015, or later approved revision.
5. Configuration E – Quick Release Mounting Provisions: (Alternate)
Installation of Quick Release Mounting Provisions in accordance with Aero Design Ltd. Document Control List, DCL1006-2, Revision 0, dated January 16, 2015, TCCA approved February 6, 2015, or later approved revision.
6. Configuration F – Quick Release Cargo Basket Installation: (Mega Basket)
Installation of Quick Release Cargo Basket in accordance with Aero Design Ltd. Document Control List DCL1006-1, Revision 0, dated January 16, 2015, TCCA approved February 6, 2015, or later approved revision.
7. Cargo Basket Modifications:
Modifications to the Cargo Basket Configuration are eligible in accordance with TCCA approved, Aero Design Ltd. document Control List DCL 704, Revision 10, dated December 18, 2014, or later approved revision.

Limitations and Conditions (continued):

6. Eligibility limitations of cargo basket modifications are noted on the drawings listed in Aero Design Ltd Document Control List DCL 704, Revision 10, dated December 18, 2014, TCCA approved February 6, 2015, or later TCCA approved revision.
7. Aero Design Ltd. Rotorcraft Flight Manual Supplement FMS751.91, Revision 2, dated December 16, 2014, TCCA approved February 6, 2015, or later TCCA approved revisions is required to all installation configurations.
8. Aero Design Ltd. Instructions for Continued Airworthiness ICA 751.90 Revision 2, dated January 13, 2015, TCCA accepted February 6, 2015, or later TCCA accepted revisions is required with the installation of quick release cargo baskets.
9. Aero Design Ltd. Instructions for Continued Airworthiness ICA800.90 Revision 3, dated January 13, 2005, TCCA accepted February 6, 2015, or later TCCA accepted revisions is required with the installation of quick release steps.
10. The installer must determine whether this design change is compatible with previously approved modifications.
11. If the holder agrees to permit another person to use this certificate to alter a product, the holder must give the other person written evidence of that permission.

-----END-----

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both. This certificate may be transferred or made available to third persons by licensing agreements in accordance with 14 CFR 21.47. Possession of this Supplemental Type Certificate (STC) document by persons other than the STC holder does not constitute rights to the design data nor to alter an aircraft, aircraft engine, or propeller. The STC's supporting documentation (drawings, instructions, specifications, flight manual supplements, etc.) is the property of the STC holder. An STC holder who allows a person to use the STC to alter an aircraft, aircraft engine, or propeller must provide that person with written permission acceptable to the FAA. (Ref. 14 CFR 21.120).

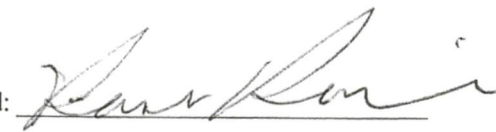
FAA APPROVED MODEL LIST (AML) NO. SR02730NY
AERO DESIGN LTD.
FOR
INSTALLATION OF QUICK RELEASE MOUNTING PROVISIONS/CARGO BASKET/STEP

Original Issue Date: September 11, 2009

Amended: November 17, 2015

ITEM	PART	REGULATION	MAKE	MODEL	ORIGINAL TYPE CERTIFICATION NUMBER	AML AMENDMENT DATE
1	7	Civil Air	Bell	205A-1 205B	H1SW	November 17, 2015
2	29	Federal Aviation	Bell	212 412 412EP 412CF	H4SW	November 17, 2015

FAA Approved: _____



Raymond Reinhardt
Acting Manager, New York
Aircraft Certification Office



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Canada

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FROM: ROUTING SYMBOL

DE: SYMBOLE D'ACHEMINEMENT _____

**EDMONTON OPERATIONS DIVISION
ENGINEERING
1100, 9700 JASPER AVENUE, NW
EDMONTON AB T5J 4E6 #31**

Transport Canada
1100 - 9700 Jasper Avenue
Canada Place
Edmonton AB T5J 4E6



PB031 1924081
002714 7R=7m
0111 141508



**Attn.: Mr. Jeff Clarke
Aero Design Ltd.
9888A Malaspina Road
POWELL RIVER BC CANADA V8Z 0G3**

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Friday, January 08, 2016

Our file Notre référence

C-15-0512
SH07-56, Issue #3
FAA SR02730NY

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC
V8A 0G3 Canada

**SUBJECT: Approval of Installation of Quick Release Mounting
Provisions/Cargo Basket/Step on the right side
or the left hand side of the helicopter.**

FAA STC: SR02730NY

Aircraft: Bell 205A-1, 212, 412, 412 CF, 412 EP

FAA STC Holder: Aero Design Ltd.

Enclosed is the original FAA Supplemental Type Certificate SR02730NY and information concerning your responsibility as a holder of a Supplemental Type Certificate SH07-56, Issue #3 issued to a Canadian Applicant.

Yours truly,

Certification Technologist
Engineering, Prairie and Northern Region

Phone: 780-495-5226
E-Mail: Jack.Staal@tc.gc.ca

Encl.

FAA APPROVED MODEL LIST (AML) NO. SR02530NY
AERO DESIGN LTD.
FOR
INSTALLATION OF QUICK RELEASE MOUNTING PROVISIONS/CARGO BASKET/STEP

Original Issue Date: September 11, 2009
Amended: November 17, 2015

ITEM	PART	REGULATION	MAKE	MODEL	ORIGINAL TYPE CERTIFICATION NUMBER	AML AMENDMENT DATE
1	7	Civil Air	Bell	205A-1 205B	H1SW	November 17, 2015
2	29	Federal Aviation	Bell	212 412 412EP 412CF	H4SW	November 17, 2015

SR 02730 NY

FAA Approved: _____


Raymond Reinhardt
Acting Manager, New York
Aircraft Certification Office



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Tuesday, February 09, 2016

Your file Votre référence

Our file Votre référence
C-15-0512
SH07-56

Aero Design Ltd.
9888A Malaspina Road
Powell River BC V8A 0G3

SUBJECT:	Approval of	Installation of Quick Release Mounting
		Provisions/Cargo Basket/Step on the right side
		or the left hand side of the helicopter.
	FAA STC:	SR02730NY
	Aircraft:	Bell 205A-1, 205B, 212, 412, 412 CF, 412 EP
	FAA STC Holder:	Aero Design Ltd.

Enclosed is the original Approved Model List (AML) for FAA Supplemental Type Certificate SR02730NY, based on Issue #3 of the Canadian Certificate SH07-56 issued to a Canadian Applicant.

Yours truly,


Certification Technologist
Prairie and Northern Region
Phone: 780-495-5227
E-Mail: Jack.Staal@tc.gc.ca

Encl.



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FROM: ROUTING SYMBOL

DE: SYMBOLE D'ACHEMINEMENT _____

**EDMONTON OPERATIONS DIVISION
ENGINEERING
1100, 9700 JASPER AVENUE, NW
EDMONTON AB T5J 4E6 #31**

**Attn.: Mr. Jeff Clarke
Aero Design Ltd.
9888A Malaspina Road
POWELL RIVER BC CANADA V8Z 0G3**

Transport Canada
1100 - 9700 Jasper Avenue
Canada Place
Edmonton AB T5J 4E6



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**EDMONTON OPERATIONS DIVISION
ENGINEERING
1100, 9700 JASPER AVENUE, NW
EDMONTON AB T5J 4E6 #31**

**Transport Canada
1100 - 9700 Jasper Avenue
Canada Place
Edmonton AB T5J 4E6**



PB031 1924061
005605 QXC10
0216 150353



**Attn.: Mr. Jeff Clarke
Aero Design Ltd.
9888A Malaspina Road
POWELL RIVER BC CANADA V8Z 0G3**



Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, British Columbia
Canada V8A 0G3

Number: SH07-56

Issue No.: 3

Approval Date: December 24, 2007

Issue Date: February 06, 2015

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

Bell 205A-1, 205B, 212, 412, 412 CF, 412 EP

Canadian Type Certificate or Equivalent:

H-104 (Bell 205B)
H-86 (Bell 212, 412, 412 CF, 412 EP)
H1SW (Bell 205A-1)

Description of Type Design Change:

Installation of Quick Release Mounting Provisions/Cargo Basket/Step on the right side or the left hand side of the helicopter.

**Installation/Operating Data,
Required Equipment and Limitations:**

Configuration A - Quick Release Mounting Provisions:

Installation of Quick Release Mounting Provisions to be accomplished in accordance with Transport Canada Civil Aviation (TCCA) approved Aero Design Ltd., Document Control List DCL751-4, Revision 0, dated 13 January 2015, or later TCCA approved revision.

Quick Release Mounting Provisions may remain installed if any other configuration is removed.

...See Continuation Sheet



Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.

F.J.B. Wright
For Minister of Transport



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1100 9700 Jasper Avenue NW
Edmonton, Alberta, T5J 4E6
Canada

Your file / Votre référence
1006

Our file / Notre référence
C-14-0978
SH07-56 Iss. 3

9 January 2015

Aero Design Ltd.
9888A Malaspina Road
Powell River, British Columbia
Canada V8A 0G3

**Subject: STC SH07-56 Issue 3, Bell 205A-1, 205B, 212, 412, 412CF, 412EP
Installation of Quick Release Mounting Provisions, Cargo Basket, and Step.**

This Supplemental Type Certificate, SH07-56 Issue 3, is issued in response to your application. Included with this original signature STC SH07-56 Issue 3 are the documents bearing original Transport Canada signatures.

The transfer of this STC SH07-56 Issue 3 in the name of another person requires the prior approval from the Minister in accordance with Section 521.357 of the Canadian Aviation Regulations (CAR).

Embodiment of modifications requiring certification of detail part fabrication and installation, in accordance with approved data identified on the certificate, is considered to be a maintenance activity and the requirements of subsection 571.06(4) of the CARs will apply.

A Canadian Holder is required to fulfill the responsibilities of a Design Approval Document Holder in accordance with Division VIII of Subpart 521 of the CAR, including the reporting of any service difficulties experienced with their product. Therefore, should you become aware of any defect, malfunction or failure resulting from the design change, it is your responsibility to submit a Service Difficulty Report to Transport Canada.

Yours truly,

J. Staal
Certification Technologist
Engineering, Edmonton
Prairie and Northern Region
780-495-5227
jack.staal@tc.gc.ca

Enclosure(s)

Canada

Enclosure List

Supplemental Type Certificate SH07-56 Issue 3
Rotorcraft Flight Manual Supplement FMS751.91 Rev 2 dated 24 December 2014
Document Control List DCL751-4 Rev 0 dated 13 January 2015
Document Control List DCL751-3 Rev 2 dated 13 January 2015
Document Control List DCL751-1 Rev 1 dated 13 January 2015
Document Control List DCL751-2 Rev 1 dated 13 January 2015
Document Control List DCL800-1 Rev 1 dated 13 January 2015
Document Control List DCL800-11 Rev 1 dated 13 January 2015
Document Control List DCL955-3 Rev 0 dated 13 January 2015
Document Control List DCL955-2 Rev 2 dated 13 January 2015
Document Control List DCL1006-2 Rev 0 dated 16 January 2015
Document Control List DCL1006-12 Rev 0 dated 16 January 2015
Document Control List DCL1006-1 Rev 0 dated 16 January 2015
Document Control List DCL1006-11 Rev 0 dated 16 January 2015
Document Control List DCL704 Rev 10 dated 18 December 2014
MSI53 for ICA951.90 Rev 2
ICA 751.90 Rev 2 dated 13 January 2015
MSI53 for ICA800.90 Rev 3
ICA 800.90 Rev 3 dated 13 January 2015
Certification Plan CP1006.10 Rev 1 dated 16 December 2014, with Appendix A initialed.


J. Staal 9 January 2015

Aero Design Ltd.



9888A Malaspina Road
Powell River, BC, V8A 0G3
Phone: 604-483-2376
Fax: 604-483-2372
www.aerodesign.ca

FMS751.91

BELL 205A-1/ 205B / 212 /
412 / 412EP / 412CF

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT

for the

INSTALLATION of the AERO DESIGN QUICK RELEASE CARGO BASKET AND/OR QUICK RELEASE STEP

CARGO BASKET MODELS:

751, 955, 1006



TCCA Supplemental Type Certificate No. SH07-56

FAA Supplemental Type Certificate No. SR02730NY

EASA Supplemental Type Certificate No. _____

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory. Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 205A-1 / 205B / 212 / 412 / 412EP / 412CF when fitted with the Quick Release Cargo Basket or Step Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.

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Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	07 Sept, 2007	None	(incorporated)	N/A
1	16 July, 2008	All	(incorporated)	N/A
2	24 Dec 2014	All		

I LIMITATIONS

1. The maximum load in the Aero Design Ltd. Quick Release Cargo Basket models 751 and 955 is 300 lb. (136 kg).

The maximum load in the Aero Design Ltd. Quick Release Cargo Basket model 1006 is 400 lb. (180 kg).

2. Only one basket may be installed on the helicopter, on the right or left side.
3. Flight operations limited to VFR conditions with Aero Design Ltd. Quick Release Cargo Basket installed.
4. Cargo Basket models 751 and 955: V_{NE} is unchanged from the basic rotorcraft.
Cargo Basket model 1006: Maximum V_{NE} is 114 KIAS, or basic aircraft V_{NE} , whichever is lowest.
5. Quick Release Step may be installed on the right and/or left side when the basket is removed. Installation on both sides is approved.
6. Cargo Basket models 955 and 1006 are not eligible on Bell 412 series rotorcraft.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket is secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.
 - c) Ensure the basket is locked in position on the beams. Pull up on the forward and aft end of the basket to check.
 - d) Ensure the step is locked in position on the beams. Pull up on the forward and aft end of the step to check.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

Cargo Basket Model 751:

1. Cruise performance and range will be reduced by approximately 10 percent with the Cargo Basket installed.
2. Climb performance will be reduced by up to 150 fpm with the Cargo Basket installed.

Cargo Basket Model 955:

1. Cruise performance and range will be reduced by approximately 15 percent with the Cargo Basket installed.
2. Climb performance will be reduced by up to 250 fpm with the Cargo Basket installed.

Cargo Basket Model 1006:

1. Cruise performance and range will be reduced by approximately 15 percent with the Cargo Basket installed.
2. Climb performance will be reduced by up to 250 fpm with the Cargo Basket installed.

V WEIGHT AND BALANCE

1. The following weight and balance is for the low mounted quick release cargo basket configuration, installed in accordance with drawing 75101 or 75103.

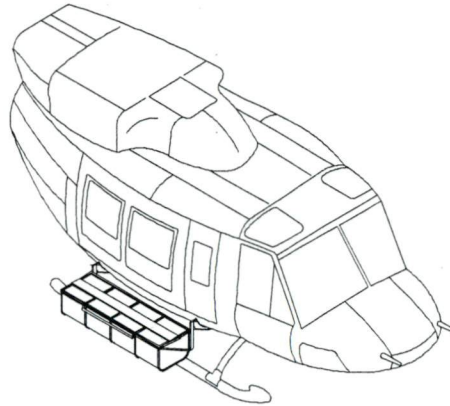


Figure 1 – Quick Release Cargo Basket Configuration (Model 751)

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
75101-01 Configuration					
Basket Only ¹	49.5 lb	119.5 in	5 915 in*lb	+/- 62.2 in	+/- 3 079 in*lb
	22.5 kg	3035 mm	68 288 mm*kg	+/- 1580 mm	+/- 35 550 mm*kg
Cargo ² (MAX)	300 lb	119.5 in	35 850 in*lb	+/- 62.2 in	+/- 18 660 in*lb
	136 kg	3035 mm	412 760 mm*kg	+/- 1580 mm	+/- 214 880 mm*kg
75103-01 Configuration					
Basket Only ¹	49.5 lb	121.0 in	5 990 in*lb	+/- 61.0 in	+/- 3 020 in*lb
	22.5 kg	3073 mm	69 143 mm*kg	+/- 1549 mm	+/- 34 853 mm*kg
Cargo ² (MAX)	300 lb	121.0 in	36 300 in*lb	+/- 61.0 in	+/- 18 300 in*lb
	136 kg	3073 mm	417 928 mm*kg	+/- 1549 mm	+/- 210 664 mm*kg
75103-02 Configuration					
Basket Only ¹	49.5 lb	121.3 in	6 005 in*lb	+/- 61.0 in	+/- 3 020 in*lb
	22.5 kg	3081 mm	69 323 mm*kg	+/- 1549 mm	+/- 34 853 mm*kg
Cargo ² (MAX)	300 lb	121.3 in	36 390 in*lb	+/- 61.0 in	+/- 18 300 in*lb
	136 kg	3081 mm	419 016 mm*kg	+/- 1549 mm	+/- 210 664 mm*kg

2. The following weight and balance is for the low mounted quick release cargo basket configuration, installed in accordance with drawing 95501 or 95502.

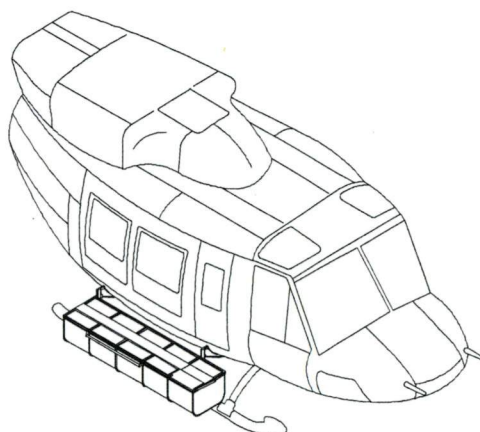


Figure 2 – Quick Release Cargo Basket Configuration (Model 955)

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
95501-01 Configuration					
Basket Only ¹	66.8 lb	111.1 in	7 422 in*lb	+/- 63.9 in	+/- 4 269 in*lb
	30.3 kg	2822 mm	85 507 mm*kg	+/- 1623 mm	+/- 49 177 mm*kg
Cargo ² (MAX)	300 lb	111.1 in	33 330 in*lb	+/- 63.9 in	+/- 19 170 in*lb
	136 kg	2822 mm	383 792 mm*kg	+/- 1623 mm	+/- 220 728 mm*kg
95502-01 Configuration					
Basket Only ¹	66.8 lb	111.7 in	7 462 in*lb	+/- 62.7 in	+/- 4 188 in*lb
	30.3 kg	2837 mm	85 961 mm*kg	+/- 1593 mm	+/- 48 268 mm*kg
Cargo ² (MAX)	300 lb	111.7 in	33 510 in*lb	+/- 62.7 in	+/- 18 810 in*lb
	136 kg	2837 mm	385 832 mm*kg	+/- 1593 mm	+/- 216 648 mm*kg
95502-02 Configuration					
Basket Only ¹	49.5 lb	111.4 in	7 442 in*lb	+/- 62.7 in	+/- 4 188 in*lb
	22.5 kg	2830 mm	85 749 mm*kg	+/- 1593 mm	+/- 48 268 mm*kg
Cargo ² (MAX)	300 lb	111.4 in	33 420 in*lb	+/- 62.7 in	+/- 18 810 in*lb
	136 kg	2830 mm	384 880 mm*kg	+/- 1593 mm	+/- 216 648 mm*kg

3. The following weight and balance is for the quick release cargo basket with standard lid configuration, installed in accordance with drawing 100601.

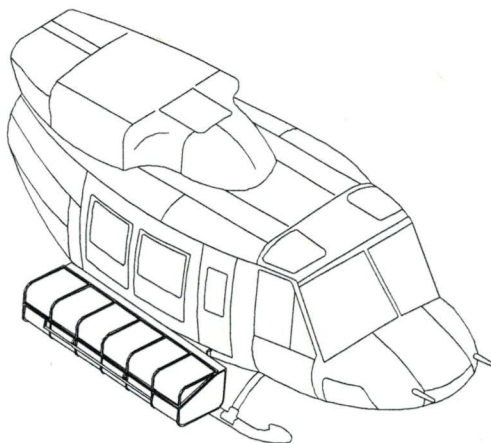


Figure 3 – Quick Release Cargo Basket Configuration (Model 100601)

Quick Release Cargo Basket Configuration – Low Mount

Item	Weight	Longitudinal		Lateral (+ right)	
		Arm	Moment	Arm	Moment
Basket Only ¹	100.0 lb	121.0 in	12 100 in*lb	+ 64.7 in	+ 6 469 in*lb
	45.4 kg	3073 mm	139 514 mm*kg	+ 1643 mm	+ 74 592 mm*kg
Cargo ² (MAX)	400 lb	121.0 in	48 400 in*lb	+ 64.7 in	+ 25 876 in*lb
	180 kg	3073 mm	553 140 mm*kg	+ 1643 mm	+ 295 740 mm*kg

Quick Release Cargo Basket Configuration – High Mount

Item	Weight	Longitudinal		Lateral (+ right)	
		Arm	Moment	Arm	Moment
Basket Only ¹	100.0 lb	121.3 in	12 131 in*lb	+ 64.7 in	+ 6 469 in*lb
	45.4 kg	3 081 mm	139 877 mm*kg	+ 1643 mm	+ 74 592 mm*kg
Cargo ² (MAX)	400 lb	121.3 in	48 524 in*lb	+ 64.7 in	+ 25 876 in*lb
	180 kg	3 081 mm	554 580 mm*kg	+ 1643 mm	+ 295 740 mm*kg

4. The following weight and balance is for the quick release cargo basket with extended lid configuration, installed in accordance with drawing 100602.

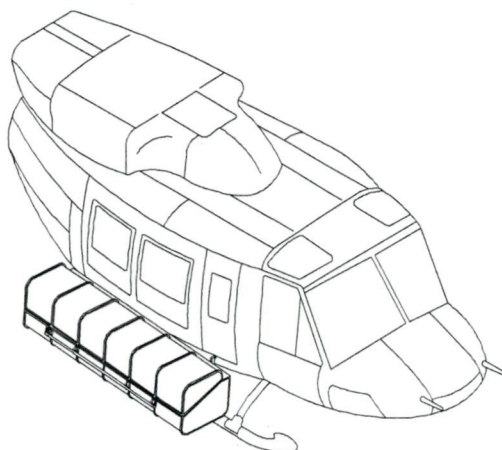


Figure 4 – Quick Release Cargo Basket Configuration (Model 100602)

Quick Release Cargo Basket Configuration – Low Mount

Item	Weight	Longitudinal		Lateral (+ right)	
		Arm	Moment	Arm	Moment
Basket Only ¹	107.2 lb	121.0 in	12 971 in*lb	+ 65.2 in	+ 6 988 in*lb
	48.6 kg	3073 mm	149 348 mm*kg	+ 1656 mm	+ 80 482 mm*kg
Cargo ² (MAX)	400 lb	121.0 in	48 400 in*lb	+ 64.7 in	+ 25 876 in*lb
	180 kg	3073 mm	553 140 mm*kg	+ 1643 mm	+ 295 740 mm*kg

Quick Release Cargo Basket Configuration – High Mount

Item	Weight	Longitudinal		Lateral (+ right)	
		Arm	Moment	Arm	Moment
Basket Only ¹	107.2 lb	121.3 in	13 223 in*lb	+ 65.2 in	+ 7 025 in*lb
	48.6 kg	3 081 mm	149 827 mm*kg	+ 1656 mm	+ 80 515 mm*kg
Cargo ² (MAX)	400 lb	121.3 in	48 524 in*lb	+ 64.7 in	+ 25 876 in*lb
	180 kg	3 081 mm	554 580 mm*kg	+ 1643 mm	+ 295 740 mm*kg

Aero Design Ltd.

FMS751.91

¹ Weight and balance is for Cargo Basket only. It is expected the mounting provisions have been included in the basic rotorcraft weight and balance at time of initial installation.

² Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length and width of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

5. The following weight and balance is for the quick release step configuration, installed in accordance with drawing 80001.

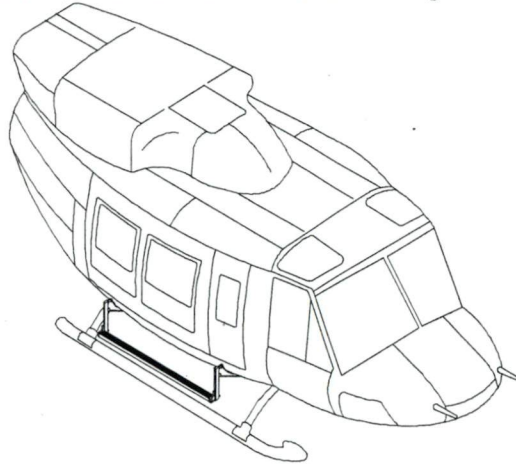


Figure 5 – Quick Release Step Configuration

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
80001-01 Configuration					
Step Only ¹	7.8 lb	119.8 in	934 in*lb	+/- 52.2 in	+/- 407 in*lb
	3.5 kg	3043 mm	10 651 mm*kg	+/- 1326 mm	+/- 4 641 mm*kg
80001-01 Configuration (Stowed)					
Step Only ¹	7.8 lb	119.8 in	934 in*lb	+/- 46.6 in	+/- 364 in*lb
	3.5 kg	3043 mm	10 651 mm*kg	+/- 1184 mm	+/- 4 144 mm*kg
80003-01 Configuration (Low)					
Step Only ¹	7.8 lb	120.7 in	942 in*lb	+/- 51.0 in	+/- 398 in*lb
	3.5 kg	3066 mm	10 731 mm*kg	+/- 1295 mm	+/- 4533 mm*kg
80003-02 Configuration (High)					
Step Only ¹	7.8 lb	120.4 in	939 in*lb	+/- 51.0 in	+/- 398 in*lb
	3.5 kg	3058 mm	10 703 mm*kg	+/- 1295 mm	+/- 4533 mm*kg

¹ Weight and balance is for Step only. It is expected the mounting provisions have been included in the basic rotorcraft weight and balance at time of initial installation.

VI INSTALLATION / REMOVAL INSTRUCTIONS

The Quick Release Mounting Beams are installed in accordance with drawing 75102, 100605 or 100606. The Quick Release Basket is installed in accordance with drawing 75101, 95501, 100601 or 100602. The Quick Release Step is installed in accordance with drawing 80001 or 80003. Removal of the basket or step leaving the beams in place is an approved configuration for flight. Logbook entry indicating installation or removal of basket or step and which weight and balance amendment is in effect is required.

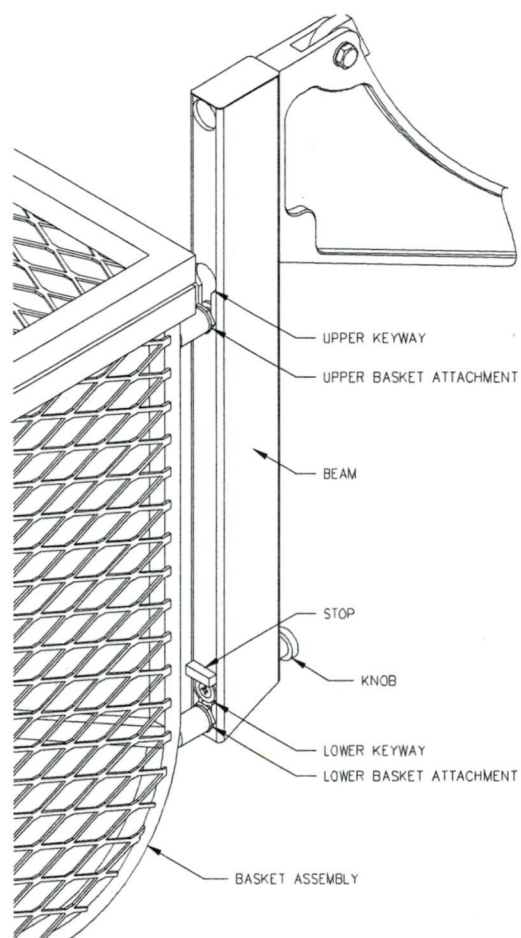


Figure 6 – Basket Attachment (751 configuration)

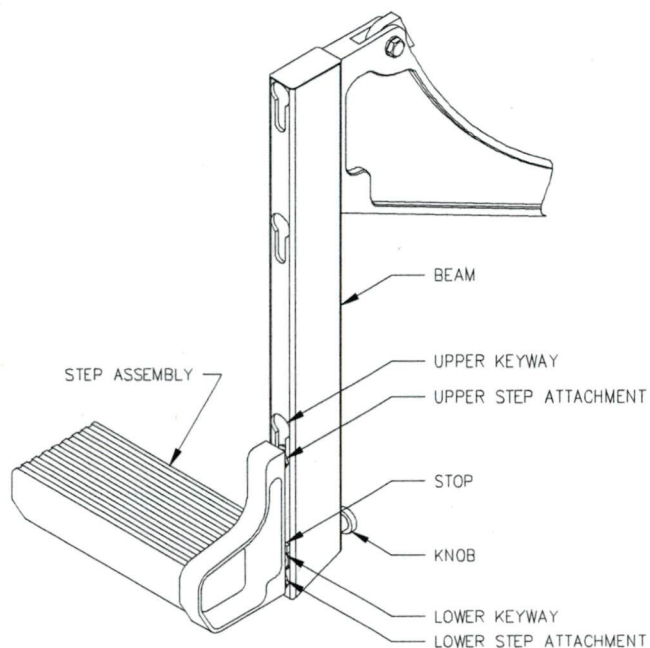


Figure 7 – Step Attachment

Installation and removal instructions are the same for the Quick Release Basket and Quick Release Step Assembly.

751 Mounting Provisions Configuration

1. Installation - Refer to Figure 6/7.
 1. Set upper attachment into upper keyway on forward and aft beams.
 2. At forward end, lift basket or step until lower attachment fitting hits stop over keyway. Push fitting into keyway and slide down until locked. Repeat for aft end.
2. Removal - Refer to Figure 6/7.
 1. Pull knob at bottom end of forward beam and lift basket or step until lower attachment fitting is free of keyway. Keep upper attachment in keyway in beam. Repeat for aft end.
 2. Lift basket or step until upper attachments are out of keyways in beams and remove from helicopter.

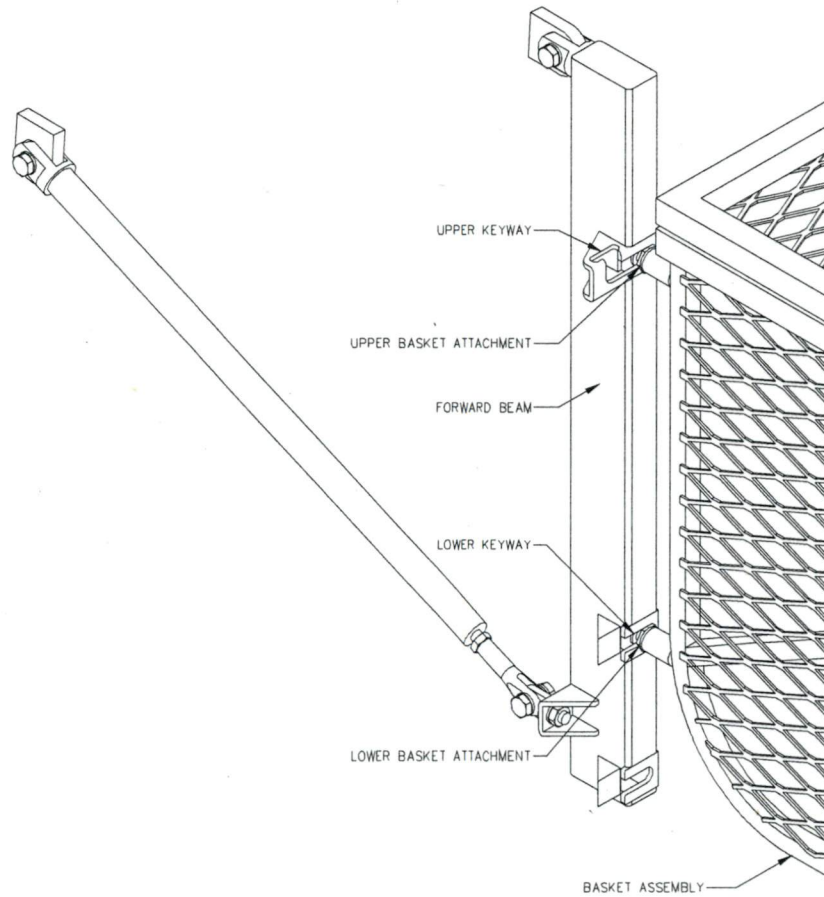


Figure 8 – Forward Basket Attachment (1006 Configuration)

1006 Mounting Provisions Configuration

1. Installation - Refer to Figure 8/9.
 1. Set upper attachment into upper keyway on forward beam.
 2. At aft end, rotate basket or step to engage lower forward attachment in lower keyway.

3. Pull basket or step aft and raise until lower attachment fitting hits stop over keyway. Push fitting into keyway and slide down until locked.

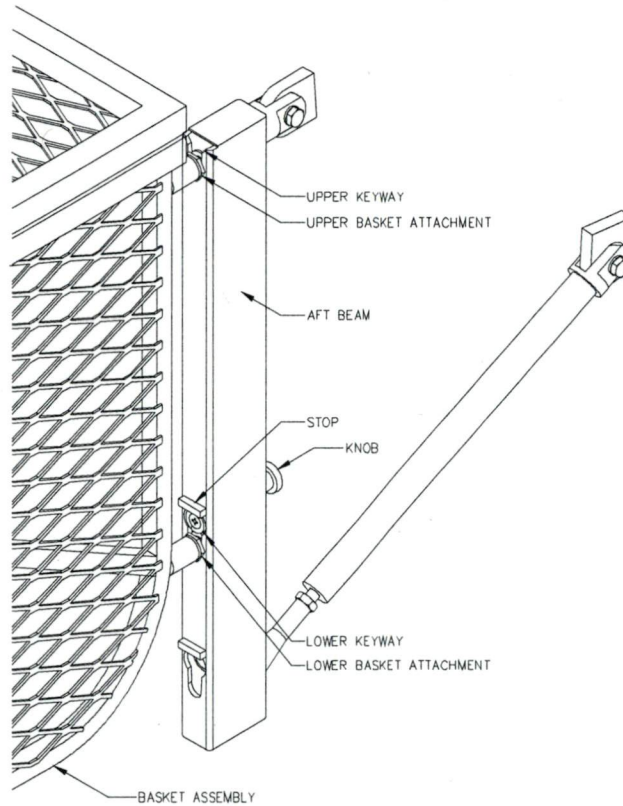


Figure 9 – Aft Basket Attachment (1006 Configuration)

2. Removal - Refer to Figure 8/9.
 1. Pull knob at bottom end of aft beam and lift basket or step until lower attachment fitting is free of keyway. Slide basket or step forward until lower forward attachment is disengaged from keyway. Lower aft end to ground.
 2. At forward end, rotate basket or step up and slide forward until upper attachment fitting is free of keyway.

CERTIFICATION PLAN
CP1006

BELL 205, 212, 214, 412

EXTERNAL CARGO BASKET INSTALLATION
REVISION TO ADD NEW CONFIGURATIONS
AND UPDATE HOLDER

Prepared by: Jeff Clarke, P.Tech.(Eng.)

Revision 1, 16 December 2014

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1.0 INTRODUCTION

This certification plan details the means and methods of compliance for the Airworthiness Requirements shown on the Compliance Program (Appendix A).

This reissue of approval SH07-56 to issue 3 is to update the holder address, incorporate minor design changes into the existing approved configuration, and add 2 new configurations.

Amendment to FAA STC SR02730NY will follow reissue of the Canadian approval.

Application to EASA for a new STC will follow reissue of the Canadian approval.

2.0 PROJECT DESCRIPTION

2.1 Existing Basket Configuration (751 Configuration)

The quick release cargo basket developed by Aero Design Ltd. for the Bell 206L and 407 is the right size for operators on forestry contracts using Bell Medium (205/212/412) helicopters. The contracts typically require a bambi-bucket, chain saw, and a few jerry cans of gasoline. All of these items fit within the Bell 206L basket and are within the existing 200 lbs weight limitation.

A quick release basket for the Bell Medium must be shortened about 3" to fit within the existing hard points under the main cabin door of the helicopter. With the exception of the change in length, the remainder of the construction of the basket is unchanged from the approved Bell 206L/407 configuration. The allowable load in the basket is increased to 300 lbs to remain competitive with existing products.

The basket and lid are fabricated from a welded 4130 steel tubing structure (3/4" rims, 1/2" hoops and spines), and lined with expanded steel mesh. The lid is attached with extruded hinge, riveted to the structure. The lid is secured closed with the handle, which is locked into brackets on the basket body, with an additional safety catch included that will retain the lid in the event the handle is not correctly latched. The lid is held open with a sliding brace that automatically locks in the open position and must be manually unlatched to close the lid. The basket attachments are located on the most forward and aft hoops of the basket, which include a brace strut to help support the outboard edge of the basket back to the attachment points.

The fixed mounts consist of a stainless steel tube bolted to a machined aluminum beam. Keyways are provided in the tube to engage the mounting lugs on the basket, and include the quick release mechanism. The aluminum beam is attached to the existing hard points located on the fuselage under the cabin doors on either side.

This configuration is currently approved, and was flight tested by TCCA on 11 December 2007. The primary changes to be incorporated include: modification of the handle installation to the current configuration used on all other approved Aero Design baskets; removal of the reinforced walkway section as this is an optional modification; and minor changes such as updating hardware part numbers. Additionally, a new configuration using the mounts for the extra large basket (see section 2.4) will provide weight and balance information for the modified position using the new mounts.

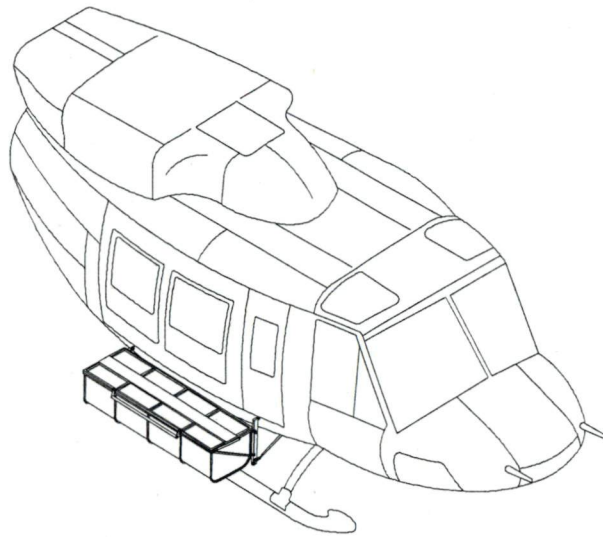


Figure 2.1 – Bell Medium Cargo Basket – Existing Configuration

2.2 Existing Cabin Step Configuration (800-1 Configuration)

The Quick Release Step is installed on the helicopter using the Mounting Provisions supplied for use with the Quick Release Cargo Basket. The step is an aluminum extrusion, with aluminum brackets welded to the ends with fittings that engage in the mounting beams. The step locks into the same mechanism on the mounting beams as the basket.

A new configuration using the mounts for the extra large basket (see section 2.4) will provide weight and balance information for the modified position using the new mounts.

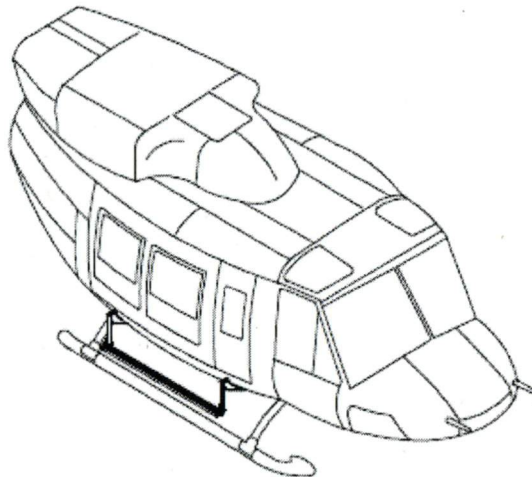


Figure 2.2 – Bell Medium Cabin Step – Existing Configuration

2.3 New Large Basket Configuration (955 Configuration)

A larger basket has been requested by current operators of the quick release cargo basket, primarily for use when heli-skiing. The width of the basket is increased over the existing approved configuration by 3.25" and the depth increased by 1" to maximize usage of available sheets of mesh. The length is also increased to 89.75", with the additional length extending out the forward end of the basket.

Basket construction remains very similar to the approved configuration, with the primary change being the forward attachment hoop, which is no longer at the very end of the basket. To increase the strength of the attachment hoop, since it will no longer have a strut for support, it is fabricated from a larger 1" tube. This configuration has been used on other approved models of Aero Design baskets of similar size and cargo capacity including the Eurocopter AS350 extra large ski basket and Bell 429 basket.

There is no change to the existing approved attachments, and the basket is positioned to maintain the same ground clearance as the existing approved configuration. The configuration was load tested to demonstrate structural compliance, and was flight tested to demonstrate it was free of excessive vibration at speeds up to V_d and to assess the general handling and performance qualities of the helicopter. This configuration has not been flight tested by TCCA.

This basket configuration has been approved on Limited STCs C-LSH12-30/D and C-LSH12-101/D, both held by Aero Design Ltd. and used by operators located in BC, and remains unchanged from these approved configurations. Additionally, a new configuration using the mounts for the extra large basket (see section 2.4) will provide weight and balance information for the modified position using the new mounts.

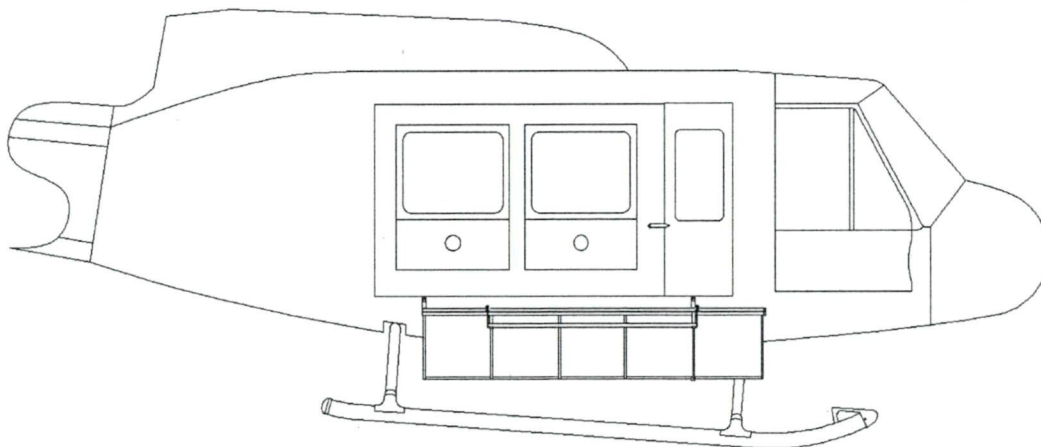


Figure 2.3 – Large Basket Configuration

2.4 New Extra Large Basket Configuration (1006 Configuration)

This new extra large basket ("MEGA" basket) is developed to accommodate two emerging requirements of Bell Medium helicopter operators: (1) heli-skiing with avalanche packs, and (2) transportation of new forest fire fighting support equipment. Operators in both operations are requesting a basket that is larger in volume, and mounted parallel to the ground (not the floor of the helicopter) with a lower loading height.

Heli-skiing

Use of avalanche packs is becoming more widespread with heli-skiers in Canada and abroad. These packs use a compressed gas charge to inflate like a life-vest to aid the wearer in reaching the top surface when caught in an avalanche and to provide an air space to prevent suffocation in the event the wearer does not reach the top. The compressed gas charge is considered a dangerous good and as such cannot be carried in the cabin of the helicopter. The packs are not particularly heavy but can take up significant volume, especially with a full load of 9-14 passengers and guides. A typical operation carries the packs, skis or snow boards, trail markers and other equipment in the basket.

Fire fighting

A new product for supporting forest fire operations is the Bambi-Max water bucket. This bucket uses the same valve for all sizes in the range, which is over 24" in diameter when the bucket is collapsed for transportation. This size is larger than the currently available cargo baskets for many models of helicopter, including the Bell Medium.

The basket

The basket is 108.75" long, 29" wide and 21" deep (inside). It is made of 4130 steel tubing and lined with expanded steel mesh with a hinged lid and locking handle with secondary safety catch, the same as all other Aero Design Ltd. products. The primary new feature is a lower outboard edge which is closed out with a lid that extends down to the lower edge. An optional extended lid is available to provide an additional 6" of height, which will be necessary to carry the Bambi-Max bucket described above. An optional walkway is provided on the lid, as well as a step on the lower forward and aft ends to aid access to the top of the basket.

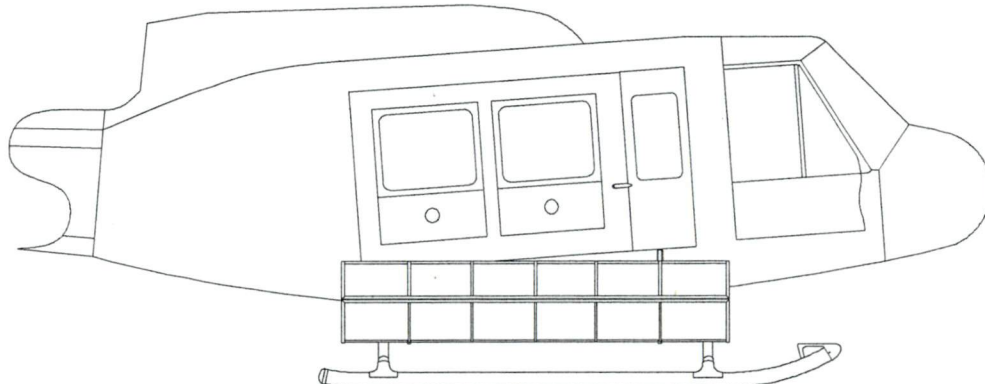


Figure 2.4 – Mega Basket Configuration

The mounts

The basket mounts are similar to the existing approved configuration. The original configuration bolts a stainless steel tube with keyways directly to the outboard face of an aluminum mounting beam, which is then fastened to hardpoints on the fuselage. This configuration causes the basket to sit parallel to the floor of the helicopter, which is at a very noticeable 4 degrees upward angle. The new configuration removes the machined aluminum beam, and attaches the stainless steel tube directly to the upper hardpoints on the fuselage, with a strut attaching the bottom of the tube to the lower fuselage hardpoint, and a drag link on the aft attachment. The attachments have the 4 degree angle built in, which allows the basket to sit parallel to the ground. The 4 degree angle causes the forward attachment to sit 4.5 inches higher than the aft attachment. Two configurations are provided, high and low mount, with the high mount locating the basket 4.5" higher than the low.

The tube configuration is similar to those used on the Eurocopter AS350 and Bell 429, which use vertical keyways on one mounting beam and horizontal keyways on the other to allow for some misalignment in the hard points on the fuselage without requiring the basket to be twisted to match the alignment on installation.

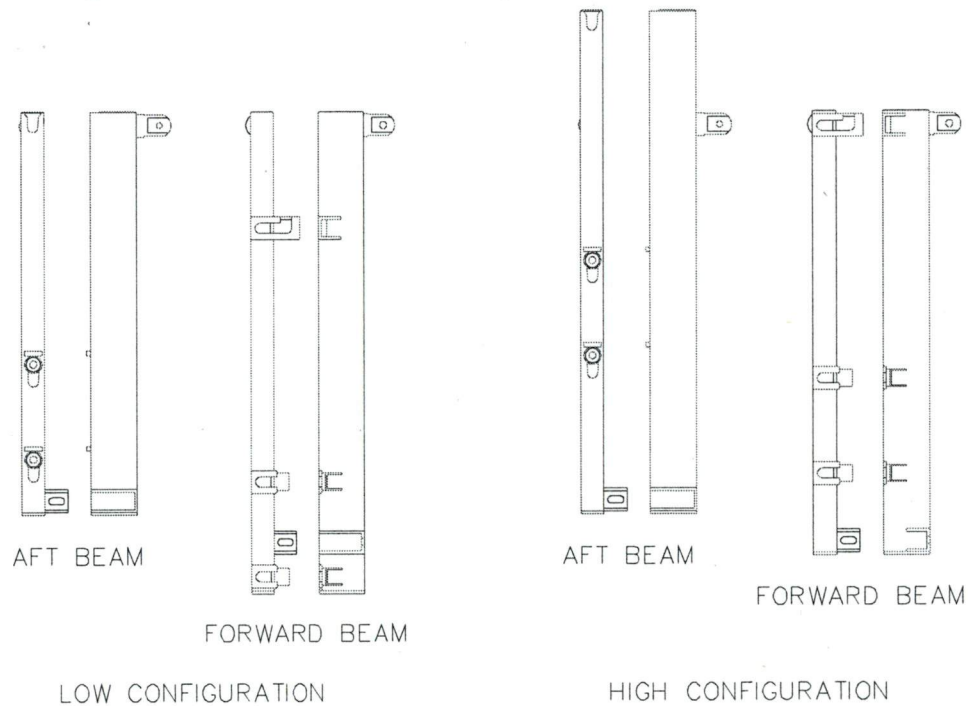


Figure 2.5 – Mounting Beams Tube Section

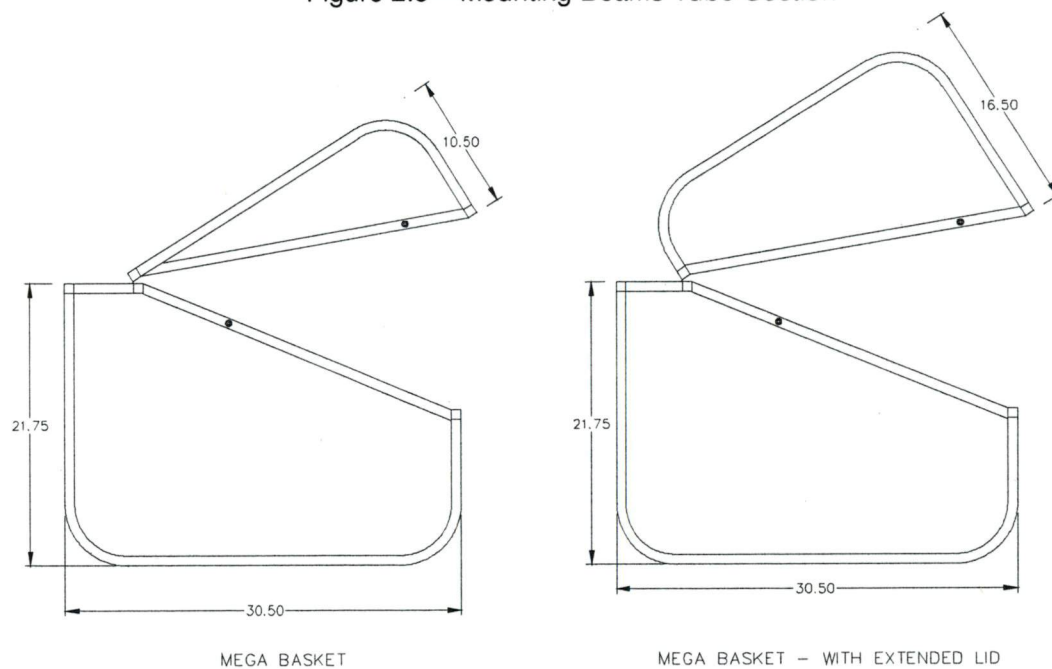


Figure 2.5 – Mega Basket Cross-Sections

2.5 Comparison of Configurations

Configuration	Max Cargo	Basket weight	Length (outside)	Width (outside)	Depth (outside)	Frontal Area	Long. C of G	Lateral C of G
Original (751)	300 lbs	49.5 lbs	72.0 in	22.5 in	17.3 in	371.5 in ²	119.5 in	62.2 in
Large (955)	300 lbs	66.8 lbs	89.3 in	25.5 in	18.6 in	457.8 in ²	111.1 in	63.9 in
Mega (1006) (Standard lid)	400 lbs	100 lbs	108.8 in	30.5 in	22.7 in	670.9 in ²	121.0 in	64.7 in
Mega (1006) (Extended lid)	400 lbs	107 lbs	108.8 in	30.5 in	28.7 in	817.6 in ²	121.0 in	64.7 in

3.0 BASIS OF CERTIFICATION

Bell 205A, 205A-1	TCDS H1SW Issue 24
Bell 205B	TCDS H-104 Issue 3 (H1SW Issue 24)
Bell 212, 412, 412EP, 412CF	TCDS H-86 Issue 12
Bell 214B, 214B-1	TCDS H-80 Issue 3

Bell 412CF, TCDS H-86, Issue 12 (latest basis of all models listed):

FAR Part 29 dated 1 February 1965; Amendments 29-1 and 29-2; and FAR 29.473, 29.663, 29.771, 29.903(c), 29.1323, and 29.1505(b) of Amend. 29-3; 29.1457 of Amend. 29-6; 29.1397 of Amend. 29-7; 29.1387 of Amend. 29-9; 29.1401, of Amend 29-11; 29.939(c) and 29.1322 of Amend. 29-12; 29.1335, 29.1351 of Amend. 29-14; 29.1353, 29.1581 of Amend. 29-15; 29.1545 of Amend. 29-17; 29.1321 of Amend 29-21; 29.151, 29.161, 29.672, 29.1303, 29.1309, 29.1325, 29.1329, 29.1331, 29.1333, 29.1355, 29.1357, 29.1555, 29.1559 of Amend. 29-24; 29.1459 of Amend 29-25; 29.1549 of Amend. 29-26; 29.501 of Amend 29-30; Appendix B to Part 29 of Amend. 29-31; 29.2 of Amend 29-32.

4.0 APPLICABILITY OF AIRWORTHINESS DIRECTIVES

Airworthiness Directives applicable to the Bell 205A, 205A-1, 205B, 212, 214B, 214B-1, 412, 412EP, and 412CF were reviewed on 14 September 2014, and none were found to affect this project.

5.0 PERSONNEL

Applicant: Aero Design Ltd. – Jeff Clarke, P.Tech.(Eng.)

Delegate: DAR304 James Tinson, P.Eng.

Transport Canada: Jack Staal, PNR Region

6.0 CERTIFICATION PLAN

6.1 General

Re-issue of the approval is to accomplish the following:

- a) Update holder contact information.
- b) Incorporate minor changes to the existing configurations of basket and cabin steps. Evaluation of the changes to the existing configuration is addressed in Section 7.0. There are no changes to the design data that invalidate the existing findings of compliance.
- c) Add large basket configuration. This configuration has been approved on 2 separate Limited STCs, and are unchanged from that approved configuration. The primary reason for issuance of the LSTCs was short notice for approval and availability of TCCA flight test personnel in the required time frame.
- d) Add extra large (mega) basket configuration – brand new configuration.

This certification plan details the means and methods of compliance for the addition of the two new configurations of cargo basket.

FAR 29 Subpart B - Flight

6.2 29.29 – Empty Weight and Corresponding C of G

6.2.1 Means of Compliance

- a) Review, calculate and inspect

6.2.2 Method of Compliance

- a) Weight and balance information required to compute the aircraft empty weight and corresponding C of G with the cargo basket, cabin steps and mounting provisions installed is provided on each installation drawing as well as in the Instructions for Continued Airworthiness.

6.2.3 Compliance Documents, Data and Testing

- a) Installation drawings: 75101, 75102, 95501, 100601, 100602, 80001
- b) Instructions for Continued Airworthiness ICA751.91 Revision 2

6.2.4 Schedule

None

6.2.5 Level of Delegation

Finding of compliance to FAR 29.29 delegated.

6.2.6 Level of Involvement / Service

None

6.3 29.45, .51, .63, .65, .67, .71, .73, .75, .141, .143, .171, .173, .175, .177, .231, 241, .251, .547 – Flight Requirements

6.3.1 Means of Compliance

a) Test

6.3.2 Method of Compliance

a) TCCA flight test to determine flight characteristics and limitations

6.3.3 Compliance Documents, Data and Testing

a) Flight test report prepared by TCCA flight test pilot

6.3.4 Schedule

Flight test to be performed by 15 November 2014

6.3.5 Level of Delegation

Not delegated

6.3.6 Level of Involvement / Service

TCCA flight test – COMPLETE 14 NOV 2014

Subpart C – Strength Requirements

6.4 29.301, .303, .305, .307, .337, .561, .625 – Strength Requirements

6.4.1 Means of Compliance

a) Analysis

b) Test

6.4.2 Method of Compliance

a) Analysis to determine applied loads

b) Analysis and load tests to show proof of compliance

6.4.3 Compliance Documents, Data and Testing

a) Engineering Report ER1006.01

b) Load Test Report TR1006.02

6.4.4 Schedule

Test plans to be submitted for acceptance by 15 October 2014

6.4.5 Level of Delegation

Finding of compliance to FAR 29.301, .303, .305, .307, .337, .561 delegated.

6.4.6 Level of Involvement / Service

TCCA to accept air drag loads in ER1006.01 – ACCEPTED 12 NOV 2014

TCCA to accept test plan of TR1006.02 prior to testing. – ACCEPTED 12 NOV 2014

Subpart D – Design and Construction

6.5 29.601, .603, .605, .609, .611 – Design Requirements

6.5.1 Means of Compliance

- a) Review and inspect

6.5.2 Method of Compliance

- a) Specifications on fabrication drawings

6.5.3 Compliance Documents, Data and Testing

- a) Fabrication drawings

6.5.4 Schedule

None

6.5.5 Level of Delegation

Finding of compliance to FAR 29.601, .603, .605, .609, .611 delegated.

6.5.6 Level of Involvement / Service

None.

6.6 29.613 – Material Requirements

6.6.1 Means of Compliance

- a) Analysis

6.6.2 Method of Compliance

- a) Strength properties in accordance with material specifications and AR-MMPDS-01 as applicable

6.6.3 Compliance Documents, Data and Testing

- a) Fabrication drawings

6.6.4 Schedule

None

6.6.5 Level of Delegation

Finding of compliance to FAR 29.613 delegated.

6.6.6 Level of Involvement / Service

None.

6.7 29.727 – Reserve Energy Drop Test**6.7.1 Means of Compliance**

a) Review and inspect.

6.7.2 Method of Compliance

a) Statement in report regarding ground clearance using guidance from AC29-2C.

6.7.3 Compliance Documents, Data and Testing

a) Engineering Report ER1006.01

6.7.4 Schedule

None

6.7.5 Level of Delegation

Finding of compliance to FAR 29.727 not delegated.

6.7.6 Level of Involvement / Service

Finding of compliance to FAR 29.827.

6.8 29.783, .807 – Doors / Emergency Exits**6.8.1 Means of Compliance**

b) Review and inspect.

6.8.2 Method of Compliance

b) Statement in report regarding access to cabin doors

6.8.3 Compliance Documents, Data and Testing

b) Engineering Report ER1006.01

6.8.4 Schedule

None

6.8.5 Level of Delegation

Finding of compliance to FAR 29.783, .807 not delegated.

6.8.6 Level of Involvement / Service

Finding of compliance to FAR 29.783, .807.

6.9 29.787 – Cargo Compartments**6.9.1 Means of Compliance**

- a) Analysis

6.9.2 Method of Compliance

- a) Compliance with FAR 29.301 through 29.307 and 29.337

6.9.3 Compliance Documents, Data and Testing

- a) Engineering Report ER1006.01
- b) Fabrication drawings

6.9.4 Schedule

None

6.9.5 Level of Delegation

Finding of compliance to FAR 29.787 delegated.

6.9.6 Level of Involvement / Service

None.

FAR 29 Subpart G – Operating Limitations and Information**6.10 29.1505, .1525, .1581, .1583(c), .1585, .1587****6.10.1 Means of Compliance**

- a) Test
- b) Flight Manual Supplement

6.10.2 Method of Compliance

- a) TCCA flight test to determine limitations
- b) Flight Manual Supplement provided which includes operating limitations, operating procedures, performance information and loading information.

6.10.3 Compliance Documents, Data and Testing

Flight Manual Supplement FMS751.91 to Revision 2

6.10.4 Schedule

FMS751.91 Revision 2 submit to TC for review by ~~15 November 2014~~

6.10.5 Level of Delegation

None

6.10.6 Level of Involvement / Service

Deliverable	Transport Canada Level of Involvement
FMS751.91	Requires Transport Canada review and approval

6.11 29.1557 – Markings and Placards**6.11.1 Means of Compliance**

a) Placard provided

6.11.2 Method of Compliance

a) Placard specifies loading limitations

6.11.3 Compliance Documents, Data and Testing

Fabrication drawings

6.11.4 Schedule

None

6.11.5 Level of Delegation

Finding of compliance to FAR 29.1557 delegated.

6.11.6 Level of Involvement / Service

None.

6.12 29.1529 - ICA**6.12.1 Means of Compliance**

b) Instructions for Continued Airworthiness provided

6.12.2 Method of Compliance

b) Instructions for Continued Airworthiness are prepared in accordance with FAR 29 Appendix A

6.12.3 Compliance Documents, Data and Testing

Instructions for Continued Airworthiness ICA751.90 to Revision 2

Changes from TCCA accepted Revision 1:

Cover: STC #s added, DCLs added, contact information updated

Section 0-3: Contact information updated

Section 0-4: Limitations regarding low skid gear

Section 0-5: Description updated to include new configurations

Section 4: Add EASA limitations statement

Section 5: Add more detailed inspections and instructions consistent with other models

Section 5-3: Remove colour references to paint/powder coating

Section 11: Add placards for new configurations

Section 25: Order changed to show removal instructions first, add instructions for new configurations, add component replacement instructions, add bill of materials, weight and balance for new configurations added, metric units added

Instructions for Continued Airworthiness ICA800.90 to Revision 3

Changes from TCCA accepted Revision 2

Cover: STC #s added, contact information updated

Section 0: Figure numbers updated

Section 0-3: Contact information updated

Section 4: FAA limitation for FAR 27 added, EASA limitation added

Section 5: Figure numbers updated

Section 5-3: Remove colour references for finish

Section 25: Figure numbers updated

Section 25-1/25-2: Removal and installation instructions switched to show removal first, instructions and figure for 100605/100606 configurations added

Section 25-3: Provisions information removed, available in basket ICA, 100605/100606 configurations added, metric units added

6.12.4 Schedule

ICA751.90 – submit to TC for review by ~~15 November 2014~~

ICA800.90 – submit to TC for review

6.12.5 Level of Delegation

None

6.12.6 Level of Involvement / Service

Deliverable	Transport Canada Level of Involvement
ICA751.90	Requires Transport Canada review and acceptance
ICA800.90	Requires Transport Canada review and acceptance

7.0 EFFECT OF CHANGES ON EXISTING FINDINGS OF COMPLIANCE

All documents - excluding engineering reports, load test reports, flight test reports or similar documents - are revised to incorporate the new company contact information and logo, which does not affect any finding of compliance. Changes beyond the address and logo are addressed below. A list of all changed documents is in Appendix B.

7.1 General

The following changes are made on a number of drawings as indicated on the drawing.

Change: Aircraft model in title block updated to: "Bell 205, 212, 214, 412 Series"

Reason: Inconsistent title on drawings, intention is to include all models listed.

Effect: None. STC dictates eligible models, provisions are available on all models listed.

Change: Hardware part numbers updated to current (e.g. AN960 Washer part numbers updated to NAS1149).

Reason: Update to current part numbers.

Effect: None.

Change: HuckMax rivets added as alternative to CherryMax rivets.

Reason: HuckMax rivets provide better forming of the rivet tail.

Effect: None. Both fasteners meet the requirements of NAS9301.

Change: Metric units added.

Reason: Not provided on previous revisions.

Effect: None.

7.2 Document Control List DCL751-1 to Revision 1 – Cargo Basket Installation

FMS751.91 to Revision 1 addressed in section 6.0 above. Requires TCCA approval.

ICA751.90 to Revision 1 addressed in section 6.0 above. Requires TCCA acceptance.

7.2.1 Drawing 75101 to Revision 2 – Cargo Basket Installation

Change: Lid prop installation drawing reference added.

Reason: Original reference was to fasteners for installing prop. Installation drawing referenced is common to all baskets.

Effect: None.

Change: Note 5 regarding handle installation removed.

Reason: Originally provided as handle was removed for shipping, this is no longer the case. Handle is installed as part of basket assembly.

Effect: None.

7.2.2 Drawing 75102 to Revision 1 – Mounting Provisions Installation

Change: Alternate MS21042 nuts added.
Reason: Allows use of available nuts.
Effect: None. Bolts loaded in shear, nut is not critical.

7.2.3 New Drawing 75103 Revision 0 – Cargo Basket Installation

Change: New drawing to use 100605 or 100606 mounting provisions.
Reason: New configuration.
Effect: Position similar to existing approved configuration, basket is smaller and has lower cargo load rating than 1006 basket.

7.3 Document Control List DCL751-2 to Revision 1 – Cargo Basket Fabrication**7.3.1 Drawing 75110 to Revision 1 – Cargo Basket Assembly**

Change: Handle installation updated to configuration 84255.
Reason: Updates to current approved configuration used on all other baskets.
Effect: New configuration provides positive retention of handle in closed position and secondary catch to prevent opening of the lid if handle is not latched.

Change: Rivets in hinge increased from 1/8 to 5/32, end rivets changed to monel.
Reason: Updates to current approved configuration used on all other baskets.
Effect: Strength increased over existing approved configuration.

7.3.2 Drawing 75111 to Revision 1 – Basket Body Fabrication

Change: Component part numbers removed (items 04-07, 11). Now identified as "tube" (item 04 and 05) of required material.
Reason: Components use same materials; some parts are common to other baskets; reduces number of drawings to be maintained.
Effect: None.

Change: Handle provisions updated to configuration 84262.
Reason: Updates to current approved configuration used on all other baskets.
Effect: None. See 75110.

Change: First and third hoops shifted 1/4" further apart.
Reason: Hoop spacing matches lid spacing; matches other baskets to allow use of same handle and fixtures.
Effect: None.

Change: Stainless steel welding rod added to welding notes.
Reason: Lid prop spacer material changed to stainless steel - see drawing 49215, Rev. 1.
Effect: None.

Change: Spacer (09) shifted to centre of tube.
Reason: Original configuration matched Bell 206L/407 fixed basket, which required clearance under the lid prop, and is no longer in new production. New configuration sets spacer on centre of tube, same as all other baskets.
Effect: None.

Change: Additional spacer (item 09) used for lid prop added to opposite end.
Reason: Basket may be installed on either side of helicopter. Preferable to have lid prop on forward end as installed. Original configuration placed lid prop forward on right side only.
Effect: None.

Change: Welding notes and symbols clarified.
Reason: Increased details of weld requirements to ensure strength of finished product and standardization with other baskets.
Effect: None.

7.3.3 Drawing 75112 to Revision 1 – Lid Fabrication

Change: Walkway (items 09, 10, 11) removed to allow for optional installation.
Reason: Walkway is already an optional configuration in accordance with drawing 70405.
Effect: None.

Change: Component part numbers removed (items 02, 03, 04). Identified as "tube" (item 02) of required material.
Reason: Components all use same material; some parts are common to other baskets; reduces number of drawings to be maintained.
Effect: None.

Change: Handle provisions updated to configuration 84263.
Reason: Updates to current approved configuration used on all other baskets.
Effect: None. See 75110.

Change: First and third brace tubes shifted 1/4" further apart.
Reason: Brace spacing matches lid configuration 69812, allowing handles to be interchanged.
Effect: None.

Change: # of welds down braces increased from every 3rd intersection to first 5 then every 2nd intersection

Reason: Standardization with other baskets.

Effect: Better load transfer from mesh into frame over approved configuration.

Change: Detail D added showing placard bracket location.

Reason: Omitted on previous revision.

Effect: None.

Change: Stainless steel welding rod added to welding notes.

Reason: Approved configuration uses stainless steel for lid handle brackets. Lid prop spacer material changed to stainless steel - see drawing 49216, Rev. 1.

Effect: None.

Change: Note 4 now specifies vent holes. Original note 4 shifted to note 5.

Reason: Vent holes allow welding gasses to expand internally, easier to close out welds around tubes.

Effect: None.

Change: Additional spacer (item 05) used for lid prop added to opposite end.

Reason: Basket may be installed on either side of helicopter. Preferable to have lid prop on forward end as installed. Original configuration placed lid prop forward on right side only.

Effect: None.

Change: 1/4" holes added for lid bumpers.

Reason: Originally shown on basket assembly, holes should be in lid before powder coating.

Effect: None.

7.3.4 Drawing 75121 to Revision 2 – Attachment Hoop Fabrication

Change: Gusset (item 04) added.

Reason: Omitted on previous issue. Gusset is installed on all existing baskets.

Effect: Increased strength over original approved configuration.

7.3.5 Drawing 75127 to Revision 1 – Placard Fabrication

Change: Contact information updated on placard.

Reason: Reflects current information.

Effect: None.

Change: Material thickness reduced from 0.063 to 0.050.
Reason: Consistency with other baskets
Effect: None, sufficient material thickness for engraving, part is not structural.

7.3.6 Drawing 75129 to Revision 2 – Lug Fabrication

Change: Gusset (item 03) added.
Reason: Omitted on previous issue. See drawing 75121.
Effect: None.

7.4 Document Control List DCL751-3 to Revision 1 – Mounting Beams Fabrication

7.4.1 Drawing 75115 to Revision 1 – Forward Beam Assembly Drawing 75116 to Revision 1 – Aft Beam Assembly

Change: Item balloon 05 corrected to 04.
Reason: Correction.
Effect: None

Change: Inside stop pin added.
Reason: Allows cabin step to be stowed on inboard side. Provisions added to down tube at earlier revision of down tube drawing (75132), but were not added to assembly.
Effect: None

7.4.2 Drawing 75132 to Revision 3 – Tube Fabrication

Change: Weld symbol attaching mid guide tube to outer tube changed from bevel to plug, diameter specified.
Reason: Incorrect weld specified, no diameter was given.
Effect: None.

Change: Cap material changed from 321 stainless steel to 304, thickness increased from 0.025 to 0.050.
Reason: Availability of material, common material to other basket beams.
Effect: Strength increased, cap is non-structural.

7.5 Document Control List DCL955-3 to Revision 0 – Ski Basket Installation

DCL955-3 Revision 0 replaces DCL955-1 (Bell 205A-1) and DCL955-11 (Bell 212) to incorporate all models, and includes common FMS751.91 and ICA751.90.
FMS751.91 to Revision 1 addressed in section 6.0 above. Requires TCCA approval.
ICA751.90 to Revision 1 addressed in section 6.0 above. Requires TCCA acceptance.

7.5.1 Drawing 95501 to Revision 1 – Ski Basket Installation

Change: Reformatted to letter size.
Reason: Consistent with other models.
Effect: None.

7.5.2 New Drawing 95502 Revision 0 – Ski Basket Installation

Change: New drawing to use 100605 or 100606 mounting provisions.
Reason: New configuration.
Effect: Position similar to existing approved configuration, basket is smaller and has lower cargo load rating than 1006 basket.

7.6 Document Control List DCL955-2 to Revision 2 – Ski Basket Fabrication**7.6.1 General**

The following applies to all drawings on DCL955-2.

Change: Drawing style (item balloons, fonts, etc.) changed; item #'s updated
Reason: Update style to be consistent with company style; items #'s were not used for all items previously, renumbered.
Effect: None.

7.6.2 Drawing 95510 to Revision 1 – Cargo Basket Assembly

Change: Left hand configuration added.
Reason: Not included in original approvals.
Effect: 751 basket and 1006 mega basket have been demonstrated to be acceptable on both sides, this basket is between these two sizes.

Change: Placard updated.
Reason: Changes to drawing 95527 included.
Effect: None.

7.6.3 Drawing 95511 to Revision 1 – Basket Body Fabrication

Change: 95530-01 hoop replaced by 94520-01 hoop
Reason: Same part, 94520-01 hoop used on a number of other baskets.
Effect: None.

Change: Left hand configuration added.
Reason: Not included in original approvals.
Effect: None. See 95510.

Change: # of welds down hoops increased from first four to first 5
Reason: Standardization with other baskets
Effect: None. Load transfer into basket frame improved over original configuration.

7.6.4 Drawing 95512 to Revision 1 – Lid Fabrication

Change: Left hand configuration added.
Reason: Not included in original approvals.
Effect: None. See 95510.

Change: # of welds down braces increased from every third to first 5 then every second.
Reason: Standardization with other baskets
Effect: None. Load transfer into lid frame improved over original configuration.

7.6.5 Drawing 95524 to Revision 1 – Attachment Hoop Fabrication

Change: Part numbers changed from 95523-XX to 95524-XX
Reason: Correction.
Effect: None.

Change: Section G-G removed, changed to complete side view.
Reason: Not a section, view is side view of hoop.
Effect: None.

7.6.6 Drawing 95527 to Revision 1 – Placard

Change: LH placard added.
Reason: LH configuration not originally included.
Effect: None, see 95510.

7.7 Document Control List DCL800-1 to Revision 1 – Cabin Step Installation

FMS751.91 to Revision 1 addressed in section 6.0 above. Requires TCCA approval.
ICA800.90 to Revision 1 addressed in section 6.0 above. Requires TCCA acceptance.

7.7.1 Drawing 80001 to Revision 1 – Cabin Step Installation

Change: Metric weight and balance.
Reason: Not provided on previous revision.
Effect: None.

Change: FMS reference changed from FMS800.91 to FMS751.91.

Reason: Incorrect reference on original revision.

Effect: None.

7.8 Document Control List DCL800-11 to Revision 1 – Cabin Step Fabrication

7.8.1 Drawing 80010 to Revision 2 – Cabin Step Assembly

Change: Weld all around ends.

Reason: Original configuration was left open to preserve a clean transition from the end bracket to the step extrusion, welding on the top is not entirely necessary as the top surface is in compression when loaded downward and therefore does not pull away from the brackets, as demonstrated in the load testing. To ensure strength in all loading conditions, the weld is made continuous around the step extrusion.

Effect: Strength increased over original configuration.

Change: Drain holes reduced from 3/8" to 1/4", shifted from 5/8" to 1" from end.

Reason: Standardization with other products.

Effect: None.

Change: Note 3 updated to add alternate paint finish.

Reason: Some colours may not be readily available in powder coat.

Effect: None.

7.9 Document Control List DCL704 to Revision 10 – Basket Modifications

7.9.1 Drawing 70407 to Revision 1 – Front End Cutout

Change: Add basket model 75111 to eligibility.

Reason: No front end cutout was provided, this configuration is appropriate to this basket.

Effect: None – same size and position as all other approved models eligible for cutouts.

APPENDIX A

COMPLIANCE PROGRAM CHECKLIST

APPLICANT: Aero Design Ltd.
9888 A Malaspina Road
Powell River, BC, Canada
V8A 0G3

DATE: 14 September 14
REVISION No. 1, 16 January 2015

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell
MODEL: 205A-1, 205B, 212, 412, 412EP, 412CF

REGISTRATION: All Eligible
SERIAL No.: All Eligible

NATURE OF WORK: Quick Release Mounting Provisions Installation; Quick Release Cargo Basket Installation

TYPE CERTIFICATE DATA SHEET: H-86, H1SW, H-104, H-80

MODEL CERTIFICATION BASIS: FAR 29 dated 1 February 1965, including amdt. 29-1, 29-2, and sections up to amdt. 29-32 (Bell 412CF, highest of all models)

MODIFICATION CERTIFICATION BASIS: FAR 29 dated 1 February 1965, including amdt. 29-1, 29-2, and sections up to amdt. 29-32 (Bell 412CF basis)

Airworthiness Requirement	FAR 29 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Subpart B - Flight						
29.29	2	Empty Weight and Corresponding C of G	Data specified on inst'n drawing			
29.45	2	Performance - General	Flight Test	X		
29.51	2	Takeoff data: General	Flight Test	X		
29.63	2	Takeoff: Category B	Flight Test	X		
29.65	2	Category B Climb: All Engines Operating	Flight Test	X		
29.71	2	Helicopter Angle of Glide: Category B	Flight Test	X		
29.73(b)	2	Performance at Min. Operating Speed	Flight Test	X		
29.75	2	Landing	Flight Test	X		
29.141	2	Flight Characteristics - General	Flight Test	X		
29.143	2	Controllability and Maneuverability	Flight Test	X		
29.171	2	Stability - General	Flight Test	X		
29.173	2	Static Longitudinal Stability	Flight Test	X		
29.175	2	Demonstration of Longitudinal Stability	Flight Test	X		
29.241	2	Ground Resonance	Flight Test	X		
29.251	2	Vibration	Flight Test	X		
				<p>304</p> <p>X <i>James Timson</i> <i>DAR No 304</i> JAN 20 2015</p> <p>Flight test performed by TCCA test pilot M. Brulotte on 14 November 2014; TCCA CIR for flight test and first article signed on 23 December 2014</p> <p>Additional flight test to expand cargo capacity performed by Aero Design on 18 December 2014 following additional successful load testing; company CIR signed on 18 December 2014; results accepted by M. Brulotte on 22 December 2014.</p> <p>Flight testing for 412 model in accordance with FTP1006.03 is pending.</p>		

Airworthiness Requirement	FAR 29 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Subpart C – Strength Requirements						
29.301	2	Loads – Air Drag Loads	Analysis	X	304	Loads accepted 12 November 2014
29.301	2	Loads – Inertia Loads	Compliance with 29.337 and 29.561	X		
29.303	2	Factor of Safety	Analysis	X		
29.305	2	Strength and Deformation		X		
29.307	2	Proof of Structure	Analysis and Test iaw Test Plan TR1006.02	X		
29.337(a)	2	Limit Maneuvering Load Factor – Positive		X		Critical load factor in downward direction.
29.547	2	Main Rotor Structure	Flight Test	X		
29.561(b)(3)	2	Emergency Landing Conditions - Occupant Protection	Analysis and Test iaw Test Plan TR1006.02	X		Forward deflection or failure of basket poses no threat to occupants of cabin. 29.337 Maneuvering Load are critical vertical loads.
29.561(c)	2	Emergency Landing Conditions - Items of Mass	Compliance with 29.561 (b)(3)	X		JAN 20 2015
29.561(d)	2	Emergency Landing Conditions - Internal fuel tanks	N/A			Installation not in area of internal fuel tanks
Subpart D – Design and Construction						
29.601	2	Design	Drawings	X		Design is conventional.
29.603	2	Materials	Drawings	X		Materials used are specified in Mil-Hdbk-5J.
29.605	2	Fabrication Methods	Drawings	X		Design is conventional.
29.609	2	Protection of Structure	Drawings	X		
29.611	2	Inspection Provisions	Drawings	X		Design is easy to inspect.
29.613	2	Material Strength Properties and Design Values	Values used as per AR-MMPDS-01	X		JAN 20 2015
29.625	2	Fitting Factor	Analysis	X		
29.727	2	Reserve Energy Drop Test	Statement in Report	X		
29.783	2	Doors	Statement in Report	X		Installation sits above bottom edge of door at aft end but does not block doors from opening.

Airworthiness Requirement	FAR 29 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
29.787(a)	2	Cargo and Baggage Compartments	Compliance with 23.301 through 307		X	JAN 20 2015
29.787(b)	2	Cargo and Baggage Compartments	Design		X	Basket is a closed container.
29.787(c)	2	Cargo and Baggage Compartments	N/A			Cargo is external to helicopter.
29.807	2	Emergency Exits	Statement in report		X	Installation does not block doors form opening, and does not block emergency access panels built into doors. JAN 20 2015
29.1387	9	Position Light System Dihedral Angles	N/A – statement in report			No change from Type Approval.
29.1401	11	Anticollision Light System	N/A – statement in report			No change from Type Approval.
Subpart G – Operating Limitations and Information						
29.1505	3	Never Exceed Speed	Flight Test,		X	V _{NE} limits to be determined by flight test
			Flight Manual Supplement		X	
29.1525	2	Kinds of Operation	Flight Manual Supplement		X	Limited to VFR only.
29.1529	2	Maintenance Manual	ICA Provided		X	
29.1557(a)	2	Miscellaneous Markings and Placards – Baggage Compartments	Placard on lid		X	JAN 20 2015
29.1581	15	Rotorcraft Flight Manual – General	Flight Manual Supplement		X	
29.1583(c)	2	Operating Limitations – Weight and Loading Information	Flight Manual Supplement		X	
29.1585	2	Operating Procedures	Flight Manual Supplement		X	
29.1587	2	Performance Information	Flight Manual Supplement		X	
29.1589	2	Loading Information	Flight Manual Supplement & Placard		X	Placard installed on basket lid

APPENDIX B

LIST OF CHANGED DOCUMENTS

Number	Title	Rev (current approved)	Rev (new)	Description of change
SH07-56	Transport Canada STC	2	3	New address, changes below
SR02730NY	FAA STC	original	(amend)	New address, changes below
	EASA STC			New
CP1006	Certification Plan	--	1	New document
DCL751-1	Document Control List – Cargo Basket Installation	1	2	Changes below, new address
75101	Cargo Basket Installation	1	2	TB (Title block updated for new address), lid prop dwg reference, note 5 removed, metric units
75102	Provisions Installation	0	1	TB, metric units
75103	Cargo Basket Installation	--	0	New drawing
FMS751.91	Flight Manual Supplement	1	2	Approval #'s on cover, added configurations
ICA751.90	Instructions for Continued Airworthiness	0	1	New address, added configurations
DCL751-2	Document Control List – Cargo Basket Fabrication	0	1	Changes below, new address
75110	Cargo Basket Assembly	0	1	TB, handle config.
75111	Basket Body Assembly	0	1	TB, handle config.
75112	Basket Lid Assembly	0	1	TB, handle config., remove walkway, adjust brace positions, lid prop lug both ends, increase # welds
75121	Basket Components – End Hoop	0	1	TB
75124	Basket Components – Rim	0	--	Removed
75125	Basket Components – Spine	0	--	Removed
75127	Basket Components – Placard	0	1	TB
75128	Basket Components – Step Brace	0	--	Removed
75129	Basket Components – Lugs	0	1	TB
69825	Basket Components – Spine	0	--	Removed
69826	Basket Components – Strut	0	--	Removed
49210	Basket Components – Hoop	1	2	TB
49212	Basket Components – Rim	0	--	Removed
49213	Basket Components – Lid Brace	1	--	Removed
49215	Basket Components – Spacer	0	1	TB, material
49216	Basket Components – Spacer	0	1	TB, material
36255	Handle Assembly	1	--	Replaced by 84255
36261	Handle Bar Assembly	3	--	Replaced by 84261
36262	Handle Bracket Assembly	1	--	Replaced by 84262
36271	Handle Lever	1	--	Replaced by 84265

Number	Title	Rev (current approved)	Rev (new)	Description of change
36272	Basket Bracket	1	--	Removed
36273	Lid Bracket	1	2	
36274	Bushing	1	3	
36275	Bushing	2	4	
36277	Handle Bar	0	1	
36278	Spring	1	3	
36280	Brace	2	3	
84240	Lid Prop Installation	--	0	New to this configuration, standard handle on all baskets
84255	Handle Installation	--	2	New to this configuration, standard handle on all baskets
84261	Handle Assembly	--	2	New to this configuration, standard handle on all baskets
84262	Basket Handle Provisions Assembly	--	2	New to this configuration, standard handle on all baskets
84263	Lid Handle Provisions Assembly	--	0	New to this configuration, standard handle on all baskets
84265	Handle Lever	--	2	New to this configuration, standard handle on all baskets
84267	Handle Bracket	--	1	New to this configuration, standard handle on all baskets
84272	Handle Bushing	--	1	New to this configuration, standard handle on all baskets
ER751.01	Engineering Report	0	0	No change
TR751.02	Test Report	0	0	No change
FTP751.03	Flight Test Plan	0	0	No change
DCL751-3	Document Control List – Mounting Beams Fabrication	1	2	Changes below, new address
75115	Forward Beam Assembly	0	1	
75116	Aft Beam Assembly	0	1	
75130	Forward Beam	0	1	
75131	Aft Beam	0	1	
75132	Down Tube	1	2	
DCL704	Document Control List – Basket Modifications	3	10	To current revision
70407	Front End Cutout Modification	0	1	TB, add 751 model

Number	Title	Rev (current approved)	Rev (new)	Description of change
DCL955-3	Document Control List – Ski Basket Installation	--	0	New document, created from DCL955-1 and DCL955-11
95501	Cargo Basket Installation	--	1	TB, lid prop dwg reference, note 5 removed, metric units
95502	Cargo Basket Installation	--	0	New drawing
75102	Provisions Installation	--	1	TB, metric units
FMS751.91	Flight Manual Supplement	--	2	Approval #'s on cover, added configurations
ICA751.90	Instructions for Continued Airworthiness	--	2	New address, added configurations
DCL955-2	Document Control List – Cargo Basket Fabrication	1	2	Changes below, new address
95510	Cargo Basket Assembly	0	1	TB, dwg style, placard, LH config
95511	Basket Body Assembly	0	1	TB, dwg style, 95530 hoop, LH config, # welds
95512	Basket Lid Assembly	0	1	TB, dwg style, LH config, # welds
95523	Basket Components – Attachment Hoop	0	1	TB
95524	Basket Components – Attachment Hoop	0	1	TB, P/Ns, section G-G
95527	Basket Components – Placard	1	2	TB, LH config
95530	Basket Components – Hoop	0	--	Removed
94520	Basket Components – Hoop	0	1	TB
49215	Basket Components – Spacer	0	1	TB, material
49216	Basket Components – Spacer	0	1	TB, material
84240	Lid Prop Installation	--	0	New drawing
84255	Handle Installation	1	2	TB
84261	Handle Assembly	1	2	TB
84262	Basket Handle Provisions Assembly	1	2	TB, Lid provisions moved to 84263
84263	Lid Handle Provisions Assembly	--	0	New drawing
84265	Handle Lever	1	2	TB
84267	Handle Bracket	0	1	TB
84272	Handle Bushing	0	1	TB
36273	Lid Bracket	1	2	TB, alternate 304 stainless material
36274	Bushing	2	3	TB
36275	Bushing	3	4	TB, material specs added, bushing (01) material, tip of support (02) reduced
36277	Handle Bar	0	1	TB
36278	Spring	2	3	TB
36280	Brace	2	3	TB
ER955.01	Engineering Report	0	0	No change
ER751.01	Engineering Report	0	0	No change
FTP751.03	Flight Test Plan	0	0	No change

Number	Title	Rev	Rev	Description of change
		(current approved)	(new)	
DCL800-1	Document Control List – Cabin Step Installation	0	1	Changes below, new address
80001	Cabin Step Installation	0	1	TB, metric units
80003	Cabin Step Installation – Alternate	--	0	New drawing
FMS751.91	Flight Manual Supplement	1	2	Approval #'s on cover, added configurations
ICA800.90	Instructions for Continued Airworthiness	0	1	New address, added configurations
DCL800-11	Document Control List – Cabin Step Assembly	0	1	Changes below, new address
80010	Cabin Step Assembly	1	2	TB, hardware, weld, drains
80020	Step End Fabrication	0	1	TB
ER800.01	Engineering Report	0	0	No change



DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
75102	Quick Release Mounting Provisions Installation	1, 13/01/2015
ICA751.90	Instructions for Continued Airworthiness	2, 13/01/2015
FMS751.91	Flight Manual Supplement	2, 24/12/2014
FABRICATION DOCUMENTS		
DCL751-3	Document Control List for Mounting Beams Assembly	2, 13/01/2015

APPROVAL: <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <div style="display: inline-block; text-align: center;"> Transport Canada </div> <div style="display: inline-block; text-align: center;"> Transports Canada </div> </div> <div style="margin-top: 10px;"> AIRCRAFT CERTIFICATION DIVISION APPROVED By <u><i>[Signature]</i></u> Appr'l No. <u>SH07-56</u> Appr'l Date <u>2007-12-24</u> Issue No. <u>3</u> Issue Date <u>2015-02-06</u> <small>YY-MM-DD</small> </div>	ORIGINAL DATE: 13 January 2015 REVISION DATE:	<div style="text-align: center;"> Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca </div> <div style="margin-top: 20px; text-align: center;"> Bell 205A-1/B, 212, 412/EP/CF Quick Release Mounting Provisions Installation (Configuration A) </div>
SHEET 1 OF 1		Rev. 0
DCL751-4		

DOCUMENT CONTROL LIST


DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
75115	Forward Beam Assembly	1, 09/12/2014
75116	Aft Beam Assembly	1, 09/12/2014
75130	Forward Beam	1, 09/12/2014
75131	Aft Beam	1, 09/12/2014
75132	Tube Assembly	3, 09/12/2014
ENGINEERING DOCUMENTS		
ER751.01	Engineering Report	0, 18/07/2007
TR751.02	Test Plan and Report	0, 31/08/2007

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	SHEET 1 OF 1	Bell 205A-1/B, 212, 412/EP/CF Quick Release Mounting Beams Fabrication
	DCL751-3	Rev. 2

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
75101	Quick Release Cargo Basket Installation	2, 13/01/2015
75103	Quick Release Cargo Basket Installation - Alternate	0, 13/01/2015
ICA751.90	Instructions for Continued Airworthiness	2, 13/01/2015
FMS751.91	Flight Manual Supplement	2, 24/12/2014
FABRICATION DOCUMENTS		
DCL751-2	Document Control List for Cargo Basket Assembly	1, 13/05/2015

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APPROVED	
By <u><i>[Signature]</i></u>	
Appr'l No. <u>5407-56</u>	
Appr'l Date <u>2007-12-24</u>	
Issue No. <u>3</u>	
Issue Date <u>2015-02-06</u> <small>YY-MM-DD</small>	

ORIGINAL DATE:
06 September 2007
REVISION DATE:
13 January 2015



Aero Design Ltd.

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SHEET 1 OF 1

**Bell 205A-1/B, 212, 412/EP/CF
Quick Release Cargo Basket
Installation (Configuration B)**




DCL751-1

Rev.

2




DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
75110	Cargo Basket Assembly	1, 07/12/2014
75111	Basket Fabrication	1, 07/12/2014
75112	Standard Lid Fabrication	1, 06/12/2014
75121	Basket Components - End Hoop	2, 07/12/2014
75127	Basket Components - Placard	1, 13/01/2015
75129	Basket Components - Lugs	2, 07/12/2014
49210	Basket Components - Hoops	2, 22/05/2014
49215	Basket Components - Spacer	1, 13/03/2014
49216	Basket Components - Spacer	1, 13/03/2014
84240	Lid Brace Installation	0, 21/05/2014
84255	Handle Assembly	2, 13/03/2014
84261	Handle Bar Assembly	2, 13/03/2014
84262	Basket Handle Provisions Assembly	2, 14/02/2014
84263	Lid Handle Provisions Assembly	0, 14/02/2014
84265	Handle Lever	2, 13/03/2014
84267	Handle Bracket	1, 13/03/2014
84272	Bushing	1, 13/03/2014
36273	Lid Bracket	2, 18/02/2014
36274	Bushing	3, 13/03/2014
36275	Bushing	4, 04/10/2013
36277	Handle Bar	1, 13/03/2014
36278	Spring	4, 01/12/2014
36280	Lid Brace Assembly	3, 13/03/2014
ENGINEERING DOCUMENTS		
ER751.01	Engineering Report	0, 18/07/2007
TR751.02	Load Test Plan and Report	0, 31/08/2007
FTP751.03	Flight Test Plan	0, 06/09/2007
	Flight Test Report – Transport Canada	11/12/2007

APPROVAL:  Transport Canada  Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <u><i>[Signature]</i></u> App'l No. <u>540756</u> App'l Date <u>2007-12-24</u> Issue No. <u>3</u> Issue Date <u>2015-02-06</u> YY - MM - DD	ORIGINAL DATE: 06 September 2007 REVISION DATE: 13 January 2015	 Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca	
	SHEET 1 OF 1	Bell 205A-1/B, 212, 412/EP/CF Quick Release Cargo Basket Fabrication	
	DCL751-2	Rev. 1	



DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
80001	Quick Release Cabin Step Installation	1, 13/01/2015
80003	Quick Release Cabin Step Installation, Alternate	0, 13/01/2015
ICA800.90	Instructions for Continued Airworthiness	3, 13/01/2015
FMS751.91	Flight Manual Supplement	2, 24/12/2014
FABRICATION DOCUMENTS		
DCL800-11	Document Control List for Quick Release Step Assembly	1, 13/01/2015

APPROVAL:  Transport Canada  Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>[Signature]</u> Appr'l No. <u>SH07-86</u> Appr'l Date <u>2007-12-24</u> Issue No. <u>3</u> Issue Date <u>2015-02-06</u> <small>YY-MM-DD</small>		ORIGINAL DATE: 15 September 2008 REVISION DATE: 13 January 2015	 Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca
SHEET 1 OF 1		Bell 205A-1/B, 212, 412/EP/CF Quick Release Cabin Step Installation (Configuration C)	
DCL800-1		Rev. 1	



DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
80010 80020	FABRICATION DOCUMENTS	
	Step Assembly Step End Fabrication	2, 11/12/2014 1, 10/12/2014
ER800.01	ENGINEERING DOCUMENTS	
	Engineering Report	0, 18/07/2007

APPROVAL:  Transport Canada Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>[Signature]</u> Appr'l No. <u>5H67-56</u> Appr'l Date <u>2007-12-24</u> Issue No. <u>3</u> Issue Date <u>2015-02-06</u> YY-MM-DD		ORIGINAL DATE: 15 September 2008 REVISION DATE: 13 January 2015	 Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca
		SHEET 1 OF 1	Bell 205A-1/B, 212, 412/EP/CF Quick Release Cabin Step Fabrication
		DCL800-11	Rev. 1

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
95501	Quick Release Cargo Basket Installation	1, 13/01/2015
95502	Quick Release Cargo Basket Installation - Alternate	0, 13/01/2015
ICA751.90	Instructions for Continued Airworthiness	2, 13/01/2015
FMS751.91	Flight Manual Supplement	2, 24/12/2014
FABRICATION DOCUMENTS		
DCL955-2	Document Control List for Cargo Basket Assembly	2, 13/01/2015

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SHEET 1 OF 1		Bell 205A-1, 205B, 212 Quick Release Cargo Basket Installation (Configuration E)	
DCL955-3		Rev. 0	

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
95510	Cargo Basket Assembly	1, 09/12/2014
95511	Basket Fabrication	1, 09/12/2014
95512	Standard Lid Fabrication	1, 09/12/2014
95523	Attachment Hoop	1, 09/12/2014
95524	Basket Components - End Hoop	1, 09/12/2014
95527	Basket Components - Placard	2, 13/01/2015
94520	Basket Components - Hoops	1, 10/04/2014
49215	Basket Components - Spacer	1, 13/03/2014
49216	Basket Components - Spacer	1, 13/03/2014
84240	Lid Brace Installation	0, 21/05/2014
84255	Handle Assembly	2, 13/03/2014
84261	Handle Bar Assembly	2, 13/03/2014
84262	Basket Handle Provisions Assembly	2, 14/02/2014
84263	Lid Handle Provisions Assembly	0, 14/02/2014
84265	Handle Lever	2, 13/03/2014
84267	Handle Bracket	1, 13/03/2014
84272	Bushing	1, 13/03/2014
36273	Lid Bracket	2, 18/02/2014
36274	Bushing	3, 13/03/2014
36275	Bushing	4, 04/10/2013
36277	Handle Bar	1, 13/03/2014
36278	Spring	4, 01/12/2014
36280	Lid Brace Assembly	3, 13/03/2014
ENGINEERING DOCUMENTS		
ER955.01	Engineering Report	0, 20/01/2012
ER751.01	Engineering Report	0, 18/07/2007
FTP955.03	Flight Test Plan	0, 27/01/2012

APPROVAL:

 Transport Canada Transports Canada
AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>[Signature]</u> Appr'l No. <u>5407-56</u> Appr'l Date <u>2007-12-24</u> Issue No. <u>3</u> Issue Date <u>2015-02-06</u> <small>YY-MM-DD</small>

ORIGINAL DATE:
09 February 2012
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13 January 2015



Aero Design Ltd.

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SHEET 1 OF 1

**Bell 205A-1, 205B, 212
Quick Release Cargo Basket
Fabrication**

DCL955-2

Rev.

2

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
100605	Quick Release Mounting Provisions Installation – Low Mounted	0, 13/01/2015
100606	Quick Release Mounting Provisions Installation – High Mounted	0, 13/01/2015
ICA751.90	Instructions for Continued Airworthiness	2, 13/01/2015
FABRICATION DOCUMENTS		
DCL1006-12	Document Control List for Quick Release Mounting Provisions Assembly	0, 16/01/2015

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SHEET 1 OF 1		Rev.
DCL1006-2		0

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
100630	Forward Beam Fabrication – Low Mounted	0, 18/12/2014
100631	Aft Beam Fabrication – Low Mounted	0, 18/12/2014
100632	Forward Beam Fabrication – High Mounted	0, 18/12/2014
100633	Aft Beam Fabrication – High Mounted	0, 18/12/2014
100635	Struts Fabrication	0, 18/12/2014
ENGINEERING DOCUMENTS		
ER1006.01	Engineering Report	0, 16/01/2015
TR1006.02	Test Plan and Report	0, 05/12/2014
FTP1006.03	Flight Test Plan and Report	0, 18/12/2014
	Flight Test Report – Transport Canada	14/11/2014

APPROVAL:



Transport
Canada

Transports
Canada

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DIVISION**

APPROVED

By

Appr'l No.

Appr'l Date

Issue No.

Issue Date

YY - MM - DD

ORIGINAL DATE:

16 January 2015

REVISION DATE:



Aero Design Ltd.

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SHEET 1 OF 1

**Bell 205A-1/B, 212, 412/EP/CF
Quick Release Mounting
Provisions Assembly**




Rev.

DCL1006-12

0

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
100601	Quick Release Mega Cargo Basket Installation – Standard Lid Configuration	0, 13/01/2015
100602	Quick Release Mega Cargo Basket Installation – Extended Lid Configuration	0, 13/01/2015
100640	Option – Step Modification Installation	0, 13/01/2015
ICA751.90	Instructions for Continued Airworthiness	2, 13/01/2015
FMS751.91	Flight Manual Supplement	2, 24/12/2014
FABRICATION DOCUMENTS		
DCL1006-11	Document Control List for Quick Release Cargo Basket Assembly	0, 16/01/2015

APPROVAL:  Transport Canada  Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>[Signature]</u> Appr'l No. <u>5107656</u> Appr'l Date <u>2007-12-24</u> Issue No. <u>3</u> Issue Date <u>2015-02-06</u> <small>YY-MM-DD</small>	ORIGINAL DATE: 16 January 2015 REVISION DATE:	 Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca
	SHEET 1 OF 1	Bell 205A-1, 205B, 212 Quick Release Mega Cargo Basket Installation (Configuration F)
	DCL1006-1	Rev. 0

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
100610	Cargo Basket Assembly	0, 26/11/2014
100611	Basket Fabrication	0, 26/11/2014
100612	Standard Lid Fabrication	0, 22/12/2014
100613	Extended Lid Fabrication	0, 26/11/2014
100616	Filler Sheet Fabrication	0, 26/11/2014
100620	Standard Hoop Fabrication	0, 26/11/2014
100621	End Hoop Fabrication	0, 26/11/2014
100622	Attachment Hoop Fabrication	0, 26/11/2014
100623	Standard Lid Hoop Fabrication	0, 26/11/2014
100624	Standard Lid End Hoop Fabrication	0, 26/11/2014
100625	Extended Lid Hoop Fabrication	0, 27/11/2014
100626	Extended Lid End Hoop Fabrication	0, 27/11/2014
100627	Placard	0, 13/01/2015
100650	Step Assembly	0, 26/11/2014
49215	Spacer	1, 13/03/2014
49216	Spacer	1, 13/03/2014
84240	Lid Brace Installation	0, 21/05/2014
84255	Handle Assembly	2, 13/03/2014
84261	Handle Bar Assembly	2, 13/03/2014
84262	Basket Handle Provisions Assembly	2, 14/02/2014
84263	Lid Handle Provisions Assembly	0, 14/02/2014
84265	Handle Lever	2, 13/03/2014
84267	Handle Bracket	1, 13/03/2014
84272	Bushing	1, 13/03/2014
36273	Lid Bracket	2, 18/02/2014
36274	Bushing	3, 13/03/2014
36275	Bushing	4, 04/10/2013
36277	Handle Bar	1, 13/03/2014
36278	Spring	4, 01/12/2014
36280	Lid Brace Assembly	3, 13/03/2014
ENGINEERING DOCUMENTS		
ER1006.01	Engineering Report	0, 16/01/2015
TR1006.02	Load Test Plan and Report	0, 05/12/2014
FTP1006.03	Flight Test Plan	0, 18/12/2014
	Flight Test Report – Transport Canada	14/11/2014

APPROVAL: <div style="display: inline-block; text-align: center;"> Transport Canada TRANSPORTS Canada </div> <div style="text-align: center; margin-top: 10px;"> AIRCRAFT CERTIFICATION DIVISION APPROVED By <u><i>[Signature]</i></u> Appr'l No. <u>SH07-56</u> Appr'l Date <u>2007-12-24</u> Issue No. <u>3</u> Issue Date <u>2015-02-06</u> <small>YY - MM - DD</small> </div>	ORIGINAL DATE: 16 January 2015 REVISION DATE:	<div style="display: flex; align-items: center;"> <div> Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca </div> </div>	
	SHEET 1 OF 1	Bell 205A-1, 205B, 212 Quick Release Mega Cargo Basket Fabrication	
	<div style="font-size: 2em; font-weight: bold;">DCL1006-11</div>		Rev. <div style="font-size: 2em; font-weight: bold;">0</div>

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
	INSTALLATION DOCUMENTS	
70408	Installation, Hangar Wheel	1, 29/05/2014
	FABRICATION DOCUMENTS	
70401	Open Forward End Modification (Bell 206L/407 Fixed and McDonnell Douglas MD600N Quick Release Only)	1, 04/12/2008
70402	Lid Door Modification	2, 29/05/2014
70403	Auxiliary Latch Modification	5, 29/05/2014
70404	Open Forward End Modification (Bell 206L/407 Quick Release Only)	2, 27/10/2011
70405	Lid Step Modification	4, 29/05/2014
70406	Open Forward End Modification (Eurocopter AS350/AS355 and Bell 206B Quick Release Only)	3, 14/07/2014
70407	Open Forward End Modification (Eurocopter EC135 Quick Release and Bell 205/212/412 Quick Release Only)	1, 16/12/2014
70411	Open Forward End Modification (Bell 206L/407 Large Quick Release Only)	0, 27/10/2011
70428	Assembly, Hangar Wheel	1, 29/05/2014
70438	Parts, Hangar Wheel	1, 29/05/2014
	ENGINEERING DOCUMENTS	
ER704.02	Engineering Report	0, 24/02/2006

APPROVAL:

	Transport Canada	Transports Canada
AIRCRAFT CERTIFICATION DIVISION		
APPROVED		
By <u><i>[Signature]</i></u>		
Appr'l No. <u>5407056</u>		
Appr'l Date <u>2007-12-24</u>		
Issue No. <u>3</u>		
Issue Date <u>2015-02-06</u>		
YY-MM-DD		

ORIGINAL DATE:

10 May 2006

REVISION DATE:

18 December 2014



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SHEET 1 OF 1

**Cargo Basket
Modifications**

Rev.

DCL704

10

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-4 TRANSPORT CATEGORY ROTORCRAFT – CAR 529

BLOCK 1

Name of the applicant for the design change approval:	Aero Design Ltd.
Description of the design change:	Installation of Quick Release Cabin Step on Bell 205/212/214/412
Certification Basis of design change and revision date:	FAR 29, Amendment 29-2
CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed:	Section 0-3 of Supplemental ICA (ICA 800.90, Rev. 3)
CAR Standard 513.05 (1) (g) (iv): Installation Instructions:	Installation Drawing 80001, 80003

BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.	ICA ref: Bell 205/212/214/412 Maintenance Manuals BHT-205A1-MM-1 BHT-212-MM BHT-214B-MM-1 BHT-412-MM	Supplemental ICA ref: Single Manual (ICA800.90, Rev. 3)
A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement.	ICA ref: Bell 205/212/214/412 Maintenance Manual	Supplemental ICA ref: Arranged in ATA format
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (a) Rotorcraft maintenance manual or section		
A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance.	ICA ref: Bell 205/212/214/412 Maintenance Manual Chapter 1	Supplemental ICA ref: Section 0-1

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances.	ICA ref: Bell 205/212/214/412 Maintenance Manual Chapter 1	Supplemental ICA ref: Section 0-5
A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 12	Supplemental ICA ref: N/A
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (b) Maintenance Instructions.		
A527.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 25	Supplemental ICA ref: Section 25-1 thru 25-2
A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 7 and 8	Supplemental ICA ref: Section 25-3
A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3	Supplemental ICA ref: Section 5-3
A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2	Supplemental ICA ref: Section 25-4
A527.3 (g) Special tools (g) A list of special tools needed.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3

Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

A529.4 AWL - Separate Section 1 The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under 529.571. If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 4	Supplemental ICA ref: Chapter 4
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BLOCK 4 – Applicant Statement of Compliance

The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.

Applicants Signature: Jeff Clarke Date: 19 December 2014

Applicants Name: Jeff Clarke, Vice President

BLOCK 5 – Minister's Statement of Acceptability

The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.

Reviewer's Name: JACK STAAL Phone # 780-495-5227 Email: jack.staal@tc.gc.ca Mail Routing Symbol: RAX1

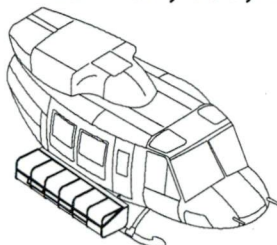
Signature: J. Staal Date: 6 Feb. 2015 NAPA Number: C-14-0978

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 751.90

BELL 205A-1 / 205B / 212 / 412 / 412EP / 412CF

QUICK RELEASE CARGO BASKETS

MODELS: 751, 955, 1006



TCCA Supplemental Type Certificate No. SH07-56
FAA Supplemental Type Certificate No. SR02730NY
EASA Supplemental Type Certificate No. _____

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when the Quick Release Cargo Basket installed in accordance with Aero Design Ltd. Document Control Lists:

DCL751-1, Revision 2 (for basket model 751)
DCL751-4, Revision 0 (for mounting provisions model 751)
DCL955-3, Revision 0 (for basket model 955)
DCL1006-1, Revision 0 (for basket model 1006)
DCL1006-2, Revision 0 (for mounting provisions model 1006)
or later approved revision, is installed.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 2
Date: 13 January 2015

Aero Design Ltd.



9888A Malaspina Road, Powell River, BC, V8A 0G3

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RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0	6 September 2007	(incorporated)	Original Issue
1	18 November 2008	(incorporated)	
2	13 January 2015		

LIST OF EFFECTIVE PAGES

List of Revisions	Revision 0 (Original Issue)	6 September, 2007
	Revision 1	18 November, 2008
	Revision 2	13 January 2015

List of Effective Pages

<u>Description</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	2
Revision Record/List of Effective Pages	2	2
Table of Contents	3	2
00-00-00	4-6	2
04-00-00	7	2
05-00-00	8-11	2
11-00-00	12	2
25-50-00	13-29	2

NOTE

Revised text is indicated by a black vertical line. A revised page with only a vertical line next to the page number indicates that text has shifted or that non-technical correction(s) were made on that page. Insert latest revision pages; dispose of superseded pages.

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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 29.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Quick Release Cargo Basket as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness

LH - Left Hand

RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Quick Release Cargo Basket. Requests for a copy may be made in writing to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

High skid landing gear installation is a mandatory prerequisite for installation of Quick Release Mounting Provisions configuration 75102-01.

High skid landing gear installation is a mandatory prerequisite for installation of the Low Mounted Quick Release Mega Cargo Basket configurations 100601-01-XX and 100602-01-XX.

Cargo Basket configurations 955 and 1006 are not currently eligible for installation on Bell 412 series helicopters.

0-5 GENERAL DESCRIPTION

The cargo basket installation is a metal mesh basket installed to the side of the helicopter on beams attached to existing hard points under the main cabin door. The quick release mechanism allows for the installation and removal of the basket quickly without tools, leaving the mounting beams in place.

There are 3 different models of basket. The inside dimensions are as follows:

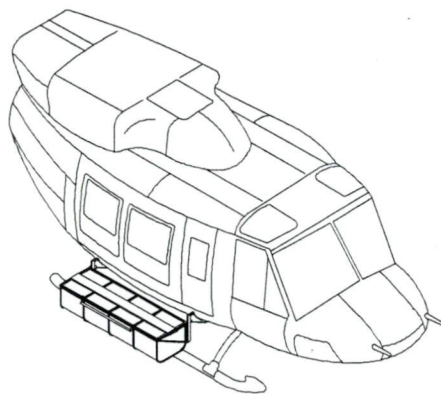
Model 751 basket: 71.5" long, 21" wide, 15.8" high.

Model 955 basket: 89.3" long, 24.3" wide, 17" deep

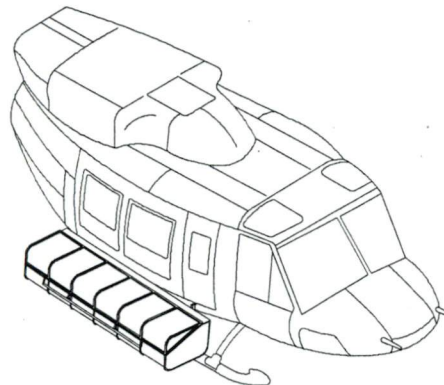
Model 1006 basket, with standard lid: 108.8" long, 29" wide, 21.1" deep

Model 1006 basket, with extended lid: 108.8" long, 29" wide, 27.1" deep

The baskets are made of a steel welded tubing structure, and lined with expanded steel mesh. The basket has a hinged lid with a locking handle and automatic safety catch.



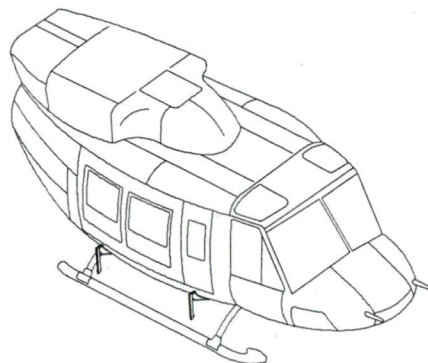
Model 751



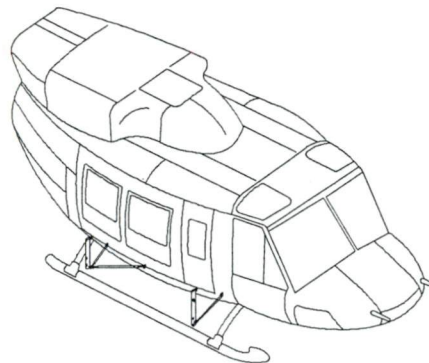
Model 1006

Figure 0.1 – Cargo Basket Installation

There are two configurations of mounting provisions. The 751 configuration consists of a machined aluminum beam to attach to the existing fuselage hard points, with a stainless steel down-tube bolted to the outboard face. The quick release mechanism is built into the down-tube on both forward and aft beams.



Model 751



Model 1006

Figure 0.2 – Mounting Provisions Installation

The 1006 configuration of mounting provisions uses stainless steel tubing beams with struts and a drag link to attach to the fuselage hard points, and is available in either high and low configuration. The mounts use horizontal keyways on the forward beam and vertical keyways with the quick release mechanism on the aft beams. This arrangement simplifies installation over the 751 configuration by allowing the basket to be positioned fore and aft to align with the vertical keyways, and simplifies removal as only 1 pin must be released to remove the basket.

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

The Airworthiness Limitations section is FAA approved and specifies maintenance required under Sections 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

EASA

The Airworthiness Limitations section is approved and variations must also be approved.

No additional airworthiness limitations have been imposed due the installation of the Quick Release Cargo Basket.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of Quick Release Cargo Basket.

Daily Inspection

1. Inspection Area: Basket

- a) Inspect the basket attachment to the beams for condition and security. Ensure quick release mechanism is completely extended, flush with the outboard surface of the beam. If pin does not completely extend, or spring tension is not sufficient to retain basket, replace spring, refer to section 25-12.
- b) Model 751 Basket, up to S/N 75101-13: Inspect latching of the lid for correct operation. If basket is bent inward the lid will close but may not latch.
- c) All baskets except Model 751 up to S/N 75101-13: Inspect latching of the lid for correct operation. Replace handle brackets on basket if handle is not retained in latched position. Refer to section 25-9.

300 Hour or Annual Inspection

1. Inspection Area: Basket

- a) Visually inspect tube-to-tube welds and mesh-to-tube welds for cracks, corrosion or other damage.
- b) Visually inspect basket mesh for damage.
- c) Visually inspect lid prop for condition and operation. Ensure prop does not extend beyond catch and catch extends to hold lid open. Refer to section 25-11 for lid prop replacement.
- d) Visually inspect handle for condition and operation. Ensure springs on lid brackets hold handle in to guide handle to engage catch (Model 751 up to S/N 75101-13) or secondary catch (all other baskets) on handle brackets. Refer to section 25-10 for handle spring replacement.

2. Inspection Area: Beams

With the basket removed:

- a) Visually inspect aluminum beams (75102 Configuration only), down-tubes, struts, and drag link, as applicable, attaching basket to the helicopter for cracks, corrosion or other damage.
- b) 75102 Configuration only: Visually inspect the AN5 bolts attaching the stainless steel tube to the aluminum beam for condition and security.
- c) Visually inspect lugs attaching the basket to the beams for security and damage.

- d) Visually inspect fasteners attaching beams, struts, and drag link, as applicable, to helicopter hard points for condition and security.

Special Inspections

Following a hard landing inspect the Quick Release Cargo Basket installation in accordance with the 300 hour or annual inspection listed above.

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Basket and Lid Tubing

Damage Limits:

- a) Deformation of any tubing between welded joints not exceeding 0.25 inch in any direction must be repaired in accordance with the instructions below.
- b) Corrosion not exceeding 0.015 inch (0.4 mm) deep to be buffed out to a smooth contour.
- c) Corrosion exceeding 0.015 inch (0.4 mm) deep to be repaired in accordance with the instructions below.

Repair Instructions:

- a) Repair Basket in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, as required.
- b) Basket is fabricated from the following materials:
 - Attachment Hoops: 1" square steel tube and/or 1/2" square steel tube
 - Lid and Rim: 3/4" square steel tube
 - Frames: 1/2" square steel tube
- c) Touch up with polyurethane paint as required following repairs.

2. Basket and Lid Mesh

Damage Limits:

- a) The basket mesh may be deformed or stretched without limit, so long as the welds attaching the mesh to the basket or lid are not compromised. If welds are compromised, repair in accordance with instructions below.
- b) Tears in the mesh not exceeding 4 cells in any direction may be repaired by patching. Maximum one repair patch per bay. See instructions below.

Repair Instructions:

- a) Repair mesh to tube welds in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, as required.
 - Mesh: 3/4" 16 ga. (0.040") expanded steel mesh

b) Patch repair:

- a. Cut two aluminum sheets, minimum 0.040 inch (1 mm) thick, extending to at least 1 complete cell outside of torn area. Drill #9 holes in the corners of the sheet, located to clear the mesh when installed.
- b. Attach patches, one inside and one outside, to the mesh with AN3 Bolts, AN970-3 Washers, and MS21044N3 Nuts.

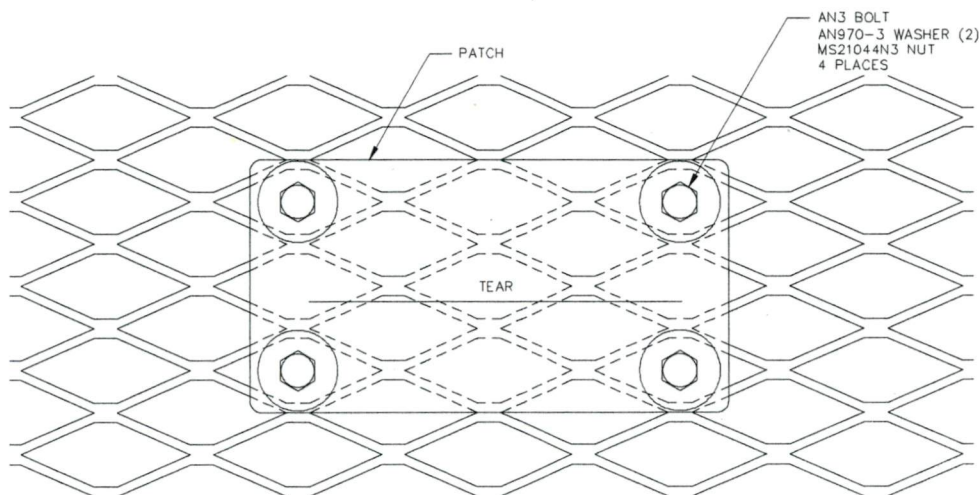


Figure 5.1 – Patch Repair

- c) Touch up with polyurethane paint as required following repairs.

3. Steel Beams

DO NOT REPAIR DAMAGE TO BEAMS IF BEYOND THE LIMITS BELOW.

- a) Nicks and/or gouges on the outboard face up to 0.030 inch (0.8 mm) deep and 0.125 inch (3.2 mm) wide may be dressed out to a smooth contour.
- b) Nicks and/or gouges on the side and inboard faces up to 0.060 inch (1.5 mm) deep and 0.125 inch (3.2 mm) wide may be dressed out to a smooth contour.
- c) 75102 Configuration only: Critical keyway dimensions are shown in Figure 5.2. Attempt to insert 27/64" drill shank into bottom end of keyway. If drill can be inserted, slot is worn beyond limit.

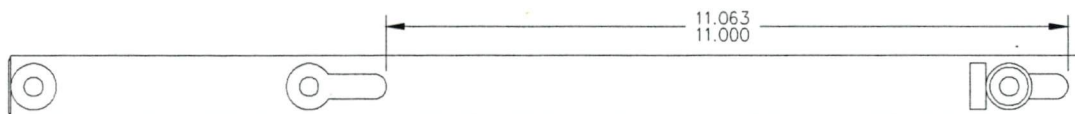


Figure 5.2 – Keyway dimensions (75102 Configuration)

- d) 100605 and 100606 Configurations only: Critical keyway dimensions are shown in Figure 5.3. Attempt to insert 15/32" drill shank into bottom of keyways. If drill can be inserted slot is worn beyond limit.

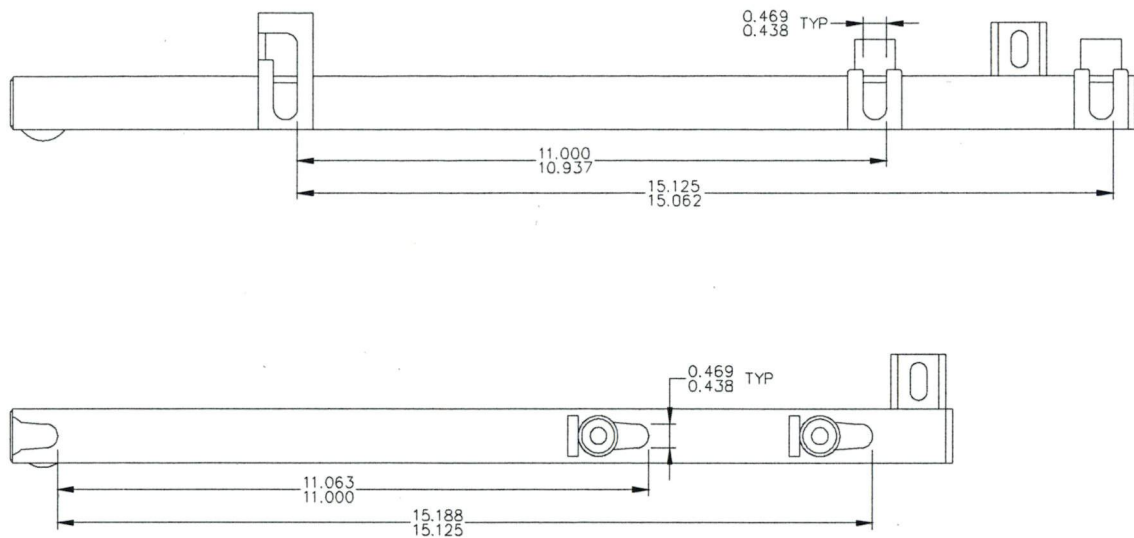


Figure 5.3 – Keyway dimensions
(100605 Configuration shown, 100606 Configuration dimensions same)

e) Touch up with polyurethane paint as required following repairs.

3. Aluminum Beams (75102 Configuration only)

DO NOT REPAIR DAMAGE TO BEAMS IF BEYOND THE LIMITS BELOW.

- Nicks and/or gouges on the top or bottom face up to 0.060 inch (1.5 mm) deep and 0.125 inch (3.2 mm) wide may be dressed out to a smooth contour.
- Nicks and/or gouges on the flanges up to 0.060 inch (1.5 mm) deep and 0.125 inch (3.2 mm) wide may be dressed out to a smooth contour.
- Nicks and/or gouges on the web up to 0.030 inch (0.8 mm) deep and 0.125 inch (3.2 mm) wide may be dressed out to a smooth contour.
- Touch up with polyurethane paint as required following repairs.

5-3 PROTECTIVE TREATMENT INFORMATION

1. Beams

The steel tube is supplied powder coated or painted. The aluminum beam (75102 configuration) is supplied painted. If the powder coat or paint is damaged, touch up with polyurethane paint.

2. Cargo Basket

The cargo basket is supplied powder coated. If the powder coat is damaged, touch up with polyurethane paint.

CHAPTER 11 – MARKINGS AND PLACARDS

The following markings and placards are used with the Quick Release Cargo Basket Installation, located on the basket lid:

a) Basket Model 751:**Basket S/N 75101-01 thru 75101-13****Basket S/N 75101-14 and Sub.****b) Basket Model 955:****Basket S/N 95501-01 and 95501-02****Basket S/N 95501-03 and Sub.****c) Basket Model 1006, with standard lid:****d) Basket Model 1006, with extended lid:**

CHAPTER 25 – EQUIPMENT AND FURNISHINGS**SECTION 50 – CARGO COMPARTMENTS**

The Quick Release Cargo Basket Installation may be applied to the right or left side of the helicopter. The Beams may be installed on both the right and left sides. A Cargo Basket may only be installed on the right or left side, not both.

25-1 ATTACHMENT PROVISIONS REMOVAL (75102 CONFIGURATION)

Refer to Figure 25.1.

1. Remove Cargo Basket. Refer to section 25-4.
2. Remove two AN5-12A Bolts, NAS1149F0563P Washers and MS21044N5 Nuts from 75115-01 Forward Beam Assembly. Remove Forward Beam.
3. Remove two AN4-12A Bolts, NAS1149F0463P Washers and MS21044N4 Nuts from 75116-01 Aft Beam Assembly. Remove Aft Beam.

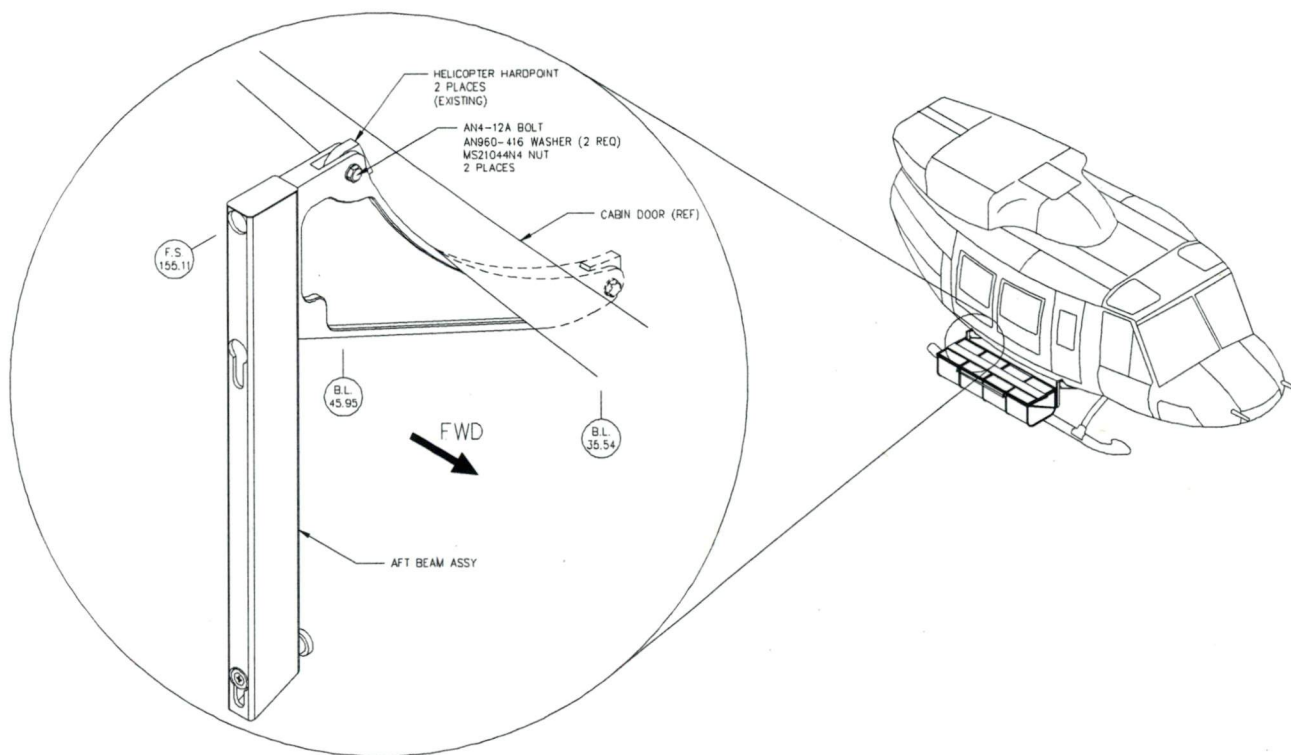


Figure 25.1 – Attachment Provisions Installation (75102 Configuration)
(Right side shown, left side similar)

25-2 ATTACHMENT PROVISIONS INSTALLATION (75102 CONFIGURATION)

Refer to Figure 25.1.

1. Ensure hard points at FS 84.46 and FS155.11 are fitted with bushings, in accordance with the original configuration of the helicopter. Bushings must be pressed flush with the surface of the lug.

2. Locate 75115-01 Forward Beam Assembly on hard points at FS 84.45. Install two AN5-12A Bolts, NAS1149F0563P Washers (2 per bolt) and MS21044N5 nuts. Torque AN5 bolts to 100-140 in-lbs (11.3-15.8 N-m).
3. Locate 75116-01 Aft Beam Assembly on hard points at FS 155.11. Install two AN4-12A Bolts, NAS1149F0463P Washers (2 per bolt), and MS21044N4 Nuts. Torque AN4 bolts to 50-70 in-lbs (5.6-7.9 N-m).

25-3 BASKET REMOVAL (75102 ATTACHMENT CONFIGURATION)

Refer to Figure 25.2.

1. Pull knob at bottom end of forward beam and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in keyway on beam.
2. Pull knob at bottom end of aft beam and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in keyway on beam.
3. Lift basket until upper attachments are out of keyways on both beams and remove basket from helicopter.

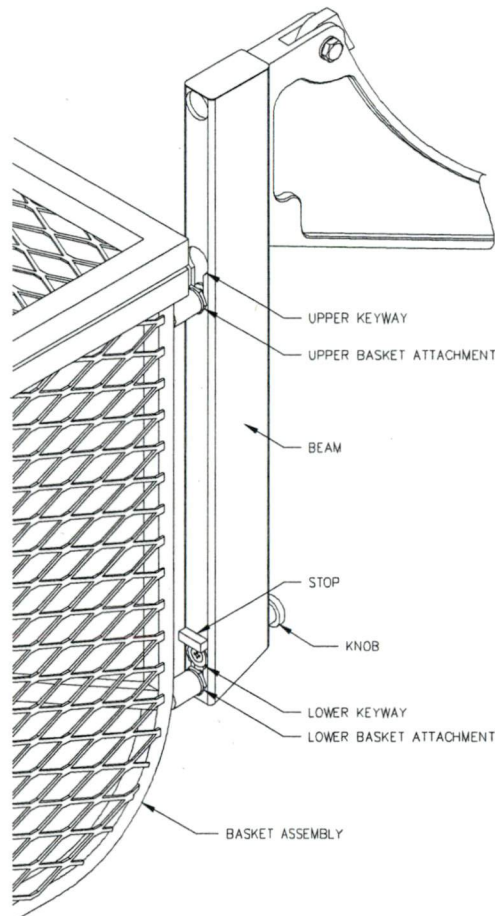


Figure 25.2 – Basket Attachment

25-4 BASKET INSTALLATION (75102 ATTACHMENT CONFIGURATION)

Refer to Figure 25.2.

1. Set basket upper attachment into upper keyway in forward and aft beams.
2. At forward end of basket, lift basket until lower attachment fitting hits stop. Push fitting into keyway and slide basket down until locked.
3. Repeat step 2 for aft end.

25-5 ATTACHMENT PROVISIONS REMOVAL (100605/100606 CONFIGURATION)

Note: It is recommended the cabin door be fully opened during installation of the 100606-01-XX High Mounted Attachment Provisions. The aft beam extends above floor level and can be rotated into the door during removal if the door is closed.

Refer to Figure 25.3.

1. Remove cargo basket, see section 25-7.
2. At forward mounting beam, remove AN5-11A bolts, NAS1149F0563P washers and MS21042-5 nuts from beam and strut at fuselage hard points. Remove forward beam with strut.
3. At forward end of drag link, remove NS21042-4 nut and NAS1149F0463P washer from fuselage hard point.
4. At aft mounting beam, remove AN4-11A bolts, NAS1149F0463P washers and MS21042-4 nuts from beam and strut at fuselage hard points. Remove aft beam with drag link.

25-6 ATTACHMENT PROVISIONS INSTALLATION (100605/100606 CONFIGURATION)

Note: It is recommended the cabin door be fully opened during installation of the 100606-01-XX High Mounted Attachment Provisions. The aft beam extends above floor level and can be rotated into the door during installation if the door is closed.

Refer to Figure 25.3.

1. At FS 84.46, locate lug on 100630-01-XX (Low) or 100632-01-XX (High) Forward Beam Assembly on upper fuselage hard point. Install AN5-11A Bolt, NAS1149F0563P Washer (2) and MS21042-5 Nut. Do not tighten nut.
2. At FS 84.46, locate 100635-01 Forward Strut on lower fuselage hard point. Install AN5-11A Bolt, NAS1149F0563P Washer (2) and MS21042-5 Nut through hard point. Install AN5-7A Bolt, NAS1149F0563P Washer (2) and MS21042-5 Nut through clevis to eye bolt at bottom of forward beam. Do not tighten nuts.
3. At FS 129.00, insert eye bolt on 100635-03 Drag Link through lower fuselage hard point. Install NAS1149F0463P Washer and MS21042-4 Nut on eye bolt. Do not tighten nut.
4. At FS 155.11, locate lug on 100631-01-XX (Low) or 100632-01-XX (High) Aft Beam Assembly on upper fuselage hard point. Install AN4-11A Bolt, NAS1149F0463P Washer (2) and MS21042-4 Nut. Do not tighten nut.

5. At FS 155.11, locate 100635-02 Aft Strut on lower fuselage hard point. Install AN4-11A Bolt, NAS1149F0463P Washer (2) and MS21042-4 Nut through hard point. Install AN45-7A Eye Bolt, NAS1149F0563P Washer and MS21042-5 Nut through clevis to eye bolt at bottom of aft beam. Do not tighten nuts.
6. On forward and aft mounting beams, adjust clevis on struts to align beams vertically by threading clevis in or out as required. Ensure clevis remains in safety through witness hole in clevis. Lock clevis in place with AN316-5R check nut on strut.
7. Set horizontal spacing between forward and aft mounting beams to 71.0 inches by sliding strut eye bolt at bottom of mounting beams and with drag link on aft beam. Thread clevises equally on both ends of drag link. Ensure clevises remain in safety through witness hole in clevis. Lock clevises in place with AN316-5R check nut on strut.
8. Install basket to check alignment of mounting beams, see section 25-8. Adjust struts and drag links as required to ensure smooth installation of basket.

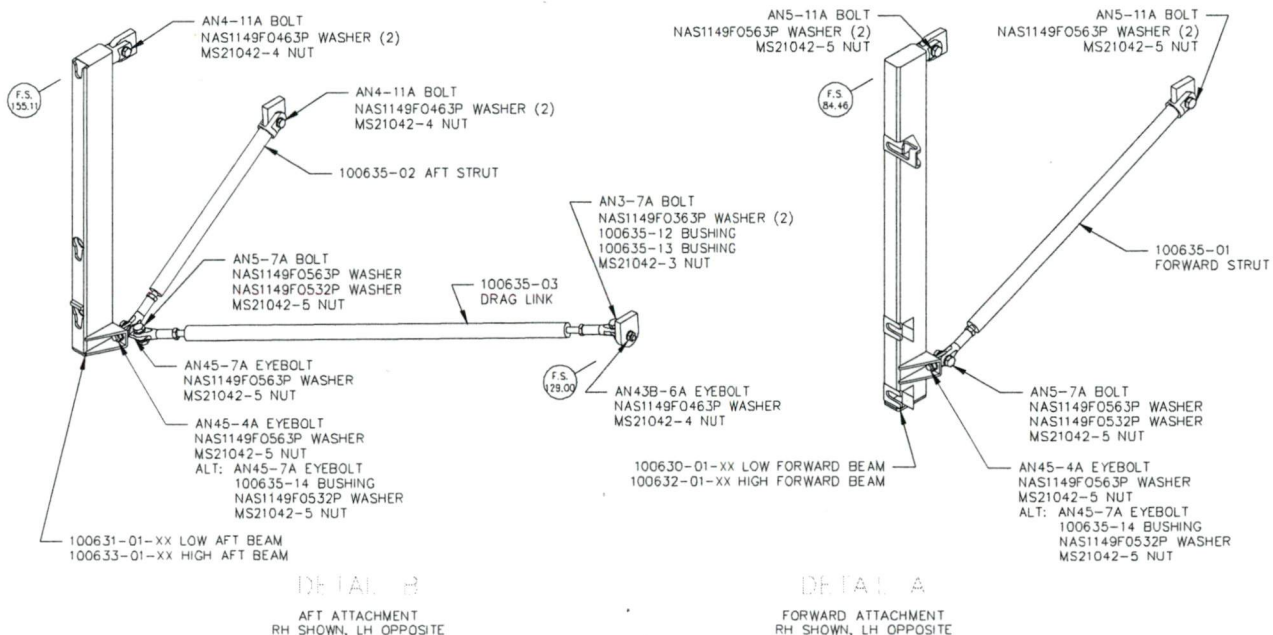
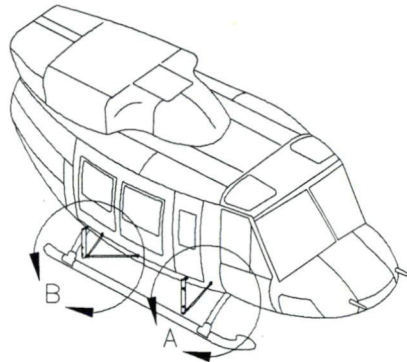


Figure 25.3 – Attachment Provisions Installation (100605/100606 Configuration)
(Right side shown, left side opposite)

9. Torque fasteners as follows:

a. AN3 Bolts:	12-15 in-lbs (1.36-1.69 N-m)
b. AN4 Bolts:	30-40 in-lbs (3.39-4.52 N-m)
c. AN5 Bolts, AN316-5R Check Nuts:	60-85 in-lbs (6.78-9.6 N-m)
d. AN43 Eye Bolt	50-70 in-lbs (5.65-7.91 N-m)
e. AN45 Eye Bolts	100-140 in-lbs (11.30-15.82 N-m)

25-7 BASKET REMOVAL (100605/100606 ATTACHMENT CONFIGURATION)

Refer to Figure 25.4.

1. At aft mounting beam, pull knob at bottom end of aft beam and lift basket until attachment fittings are free of keyways.
2. Slide basket forward to disengage lower forward attachment. Rest aft end of basket on floor.
3. At forward mounting beam, slide basket forward and raise basket until upper forward attachment is free of keyway.

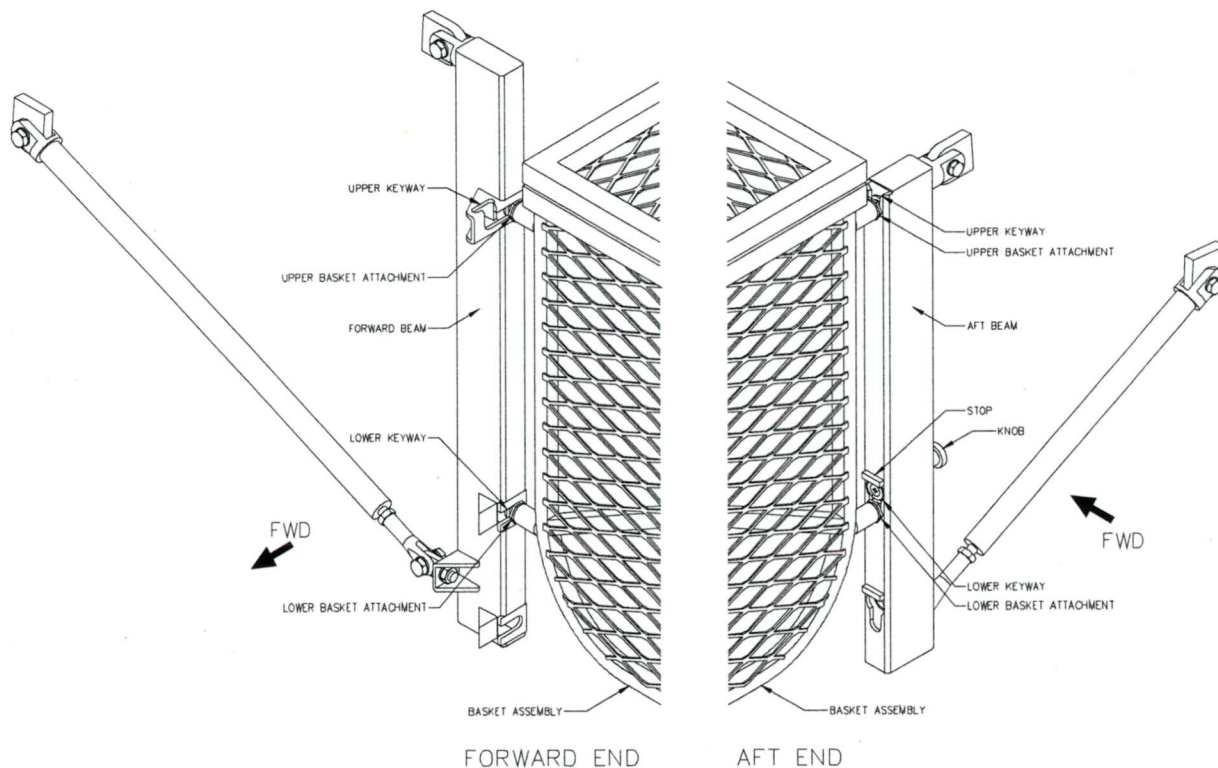


Figure 25.4 – Cargo Basket Installation
 (Left side shown, right side opposite)
 (751 Basket shown, 955 Basket similar)
 (1006 Basket similar, uses bottom keyways)

25-8 BASKET INSTALLATION (100605/100606 ATTACHMENT CONFIGURATION)

Refer to Figure 25.4.

1. Set basket upper forward attachment into upper keyway in forward beam. Aft end of basket may rest on floor.
2. Lift basket from aft end and slide lower forward attachment into keyway in forward beam.
3. Raise aft end of basket to aft beam, sliding basket aft, and lift until lower attachment fitting hits stop over keyway.
4. Push fitting into lower keyway, ensure top fitting enters top keyway, and slide basket down until locked. Pull up on aft end of basket to ensure basket is locking in place on aft beam.

25-9 HANDLE BRACKET REPLACEMENT

Refer to Figure 25.5.

1. Remove two (2) AN3-11A Bolts, NAS1149F0363P Washers and MS21044N3 Nuts from each Handle Bracket (84267-01). Remove handle brackets from basket hoops.
2. Slide two (2) replacement Handle Brackets (84267-01) onto basket hoops. Align Handle Bracket to bushings in hoop. Insert two (2) AN3-11A Bolts with NAS1149F0363P Washers through Handle Bracket and bushing. Install NAS1149F0363P Washer and MS21044N3 Nut on each bolt. Torque nuts to 20-25 in-lbs (2.3-2.8 N-m).

25-10 HANDLE SPRING REPLACEMENT

Refer to Figure 25.5.

1. Remove two (2) AN3-12A Bolts, NAS1149F0363P Washers (2) and MS21044N3 Nuts attaching handle to lid. Remove handle from basket. Remove springs from handle.
2. Slide replacement 36278-01R and 36278-01L Springs onto handle. Spring arm will catch on hook when on the correct side. Insert two 36275-01 bushings into handle attachments. Locate handle on basket, and insert two (2) AN3-12A Bolts with NAS1149F0363P Washers through bracket on lid and bushing in handle. Install NAS1149F0363P Washer and MS21044N3 Nut on each bolt. Torque nuts to 20-25 in-lbs (2.3-2.8 N-m). Lift spring arm over catch on handle and bar on lid bracket.

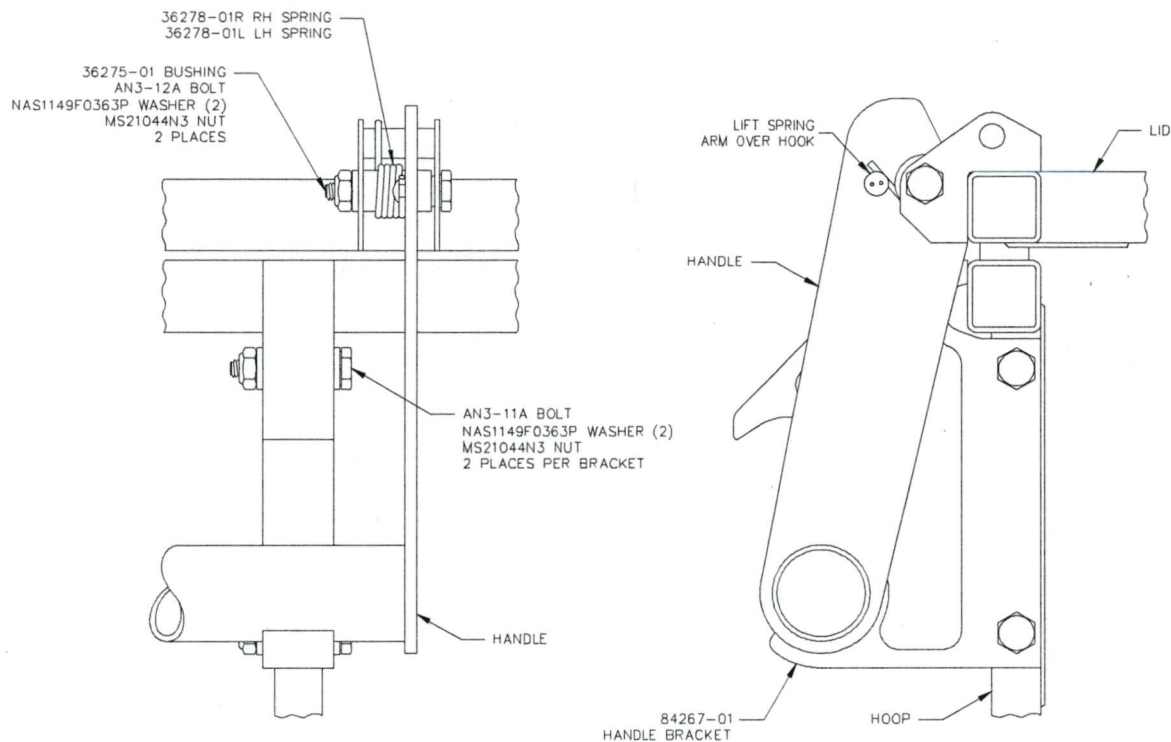


Figure 25.5 – Handle Bracket Parts

25-11 LID PROP REPLACEMENT

1. Remove AN3-15A and AN3-17A Bolts, NAS1149F0363P Washers (3), AN970-3 Washers (2) and MS21044N3 Nuts attaching lid prop to basket assembly. Remove lid prop from basket
2. Locate replacement 36280-01 Lid Prop on bushings at forward end of basket and lid.
3. Insert AN970-3 Washer into lid end of prop, and slide AN3-15A Bolt with NAS1149F0363P Washer through bushing in lid. Install NAS1149F0363P Washer and MS21044N3 Nut on bolt.
4. Slide AN3-17A Bolt with AN970-3 Washer through bushing in basket. Install NAS1149F0363P Washer and MS21044N3 Nut on bolt.
5. Ensure lid prop is seated on bushings and torque nuts to 20-25 in-lbs (2.3-2.8 N-m).

25-12 QUICK RELEASE PIN SPRING REPLACEMENT

1. Remove basket from mounting beams, refer to section 25-3 or 25-7 as applicable.
2. At lower attachment keyway on aft beam, remove MS21044C3 Nut from #10-32 stainless steel countersunk screw and remove 69830-13 Knob, 69830-12 Stop, and 69830-23 Spring. Discard defective Spring.

3. Place 69830-12 Stop on #10-32 stainless steel countersunk screw. Slide replacement 69830-23 Spring onto Stop. Insert screw/Stop/Spring into guide in lower keyway of beam. Install 69830-13 Knob and MS21044C3 Nut on inboard side of beam. Torque nut to 20-25 in-lbs (2.3-2.8 N-m).

25-13 BILL OF MATERIALS

75102 MOUNTING PROVISIONS INSTALLATION

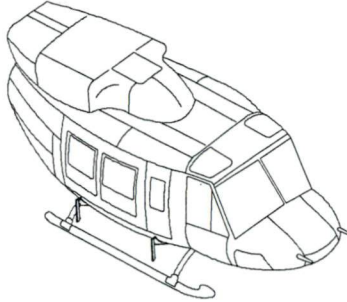


Figure 25.6 – 75102 Mounting Provisions Installation

Qty.	Part Number	Description
1	75102-01	Mounting Provisions Installation
. 1	75115-01	Forward Mounting Beam Assembly
. 1	75116-01	Aft Mounting Beam Assembly
. 2	AN5-12A	Bolt
. 4	NAS1149FO563P	Washer
. 2	MS21044N5	Nut
. 2	AN4-12A	Bolt
. 4	NAS1149FO463P	Washer
. 2	MS21044N4	Nut

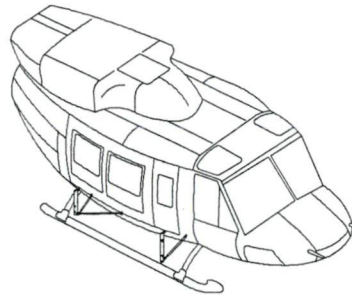
100605 / 100606 EXTERNAL ATTACHMENT PROVISIONS INSTALLATION

Figure 25.7 – 100605/100606 External Attachment Provisions Installation

Qty.	Part Number	Description
1	100605-01-XX	External Attachment Provisions Installation, Low Mounted
. 1	100630-01-XX	Forward Mounting Beam Assembly, Low
. 1	100631-01-XX	Aft Mounting Beam Assembly, Low
1	100606-01-XX	External Attachment Provisions Installation, High Mounted
. 1	100632-01-XX	Forward Mounting Beam Assembly, High
. 1	100633-01-XX	Aft Mounting Beam Assembly, High
		All continued
. 1	100635-01	Forward Strut
. 1	100635-02	Aft Strut
. 1	100635-03	Drag Link
. 1	100635-12	Bushing
. 1	100635-13	Bushing
. 2	AN5-7A	Bolt
. 2	AN5-11A	Bolt
. 2	AN45-4A	Eye Bolt
. 1	AN45-7A	Eye Bolt
. 2	AN4-11A	Bolt
. 1	AN43B-6A	Eye Bolt
. 1	AN3-7A	Bolt
. 9	NAS1149FO563P	Washer
. 2	NAS1149FO532P	Washer
. 5	NAS1149FO463P	Washer
. 2	NAS1149FO363P	Washer
. 7	MS21042-5	Nut
. 3	MS21042-4	Nut
. 1	MS21042-3	Nut

751 STANDARD CARGO BASKET INSTALLATION

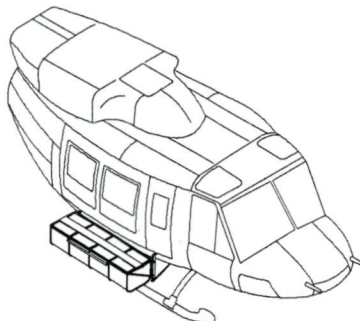


Figure 25.8 – 751 Standard Cargo Basket Installation

Qty.	Part Number	Description
1	75101-01	Basket Installation, Standard
. 1	75102-01	Mounting Provisions Installation
. 1	75110-01	Basket Assembly, Standard
1	75103-01-XX	Basket Installation, Standard, Low Mounted
. 1	100605-01-XX	External Attachment Provisions Installation, Low Mounted
. 1	75110-01	Basket Assembly, Standard
1	75103-02-XX	Basket Installation, Standard, High Mounted
. 1	100606-01-XX	External Attachment Provisions Installation, High Mounted
. 1	75110-01	Basket Assembly, Standard

955 EXTRA LARGE CARGO BASKET INSTALLATION

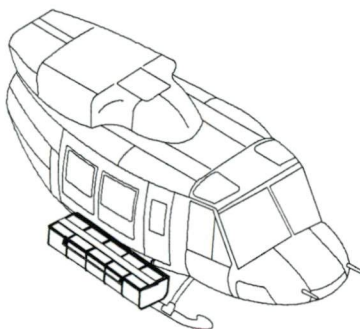


Figure 25.9 – 955 Extra Large Cargo Basket Installation

Qty.	Part Number	Description
1	95501-01-XX	Basket Installation, Extra Large
. 1	75102-01	Mounting Provisions Installation
. 1	95510-01-XX	Basket Assembly, Extra Large
1	95502-01-XX	Basket Installation, Extra Large, Low Mounted
. 1	100605-01-XX	External Attachment Provisions Installation, Low Mounted
. 1	95510-01-XX	Basket Assembly, Extra Large
1	95503-02-XX	Basket Installation, Extra Large, High Mounted
. 1	100606-01-XX	External Attachment Provisions Installation, High Mounted
. 1	95510-01-XX	Basket Assembly, Extra Large

1006 MEGA CARGO BASKET INSTALLATION

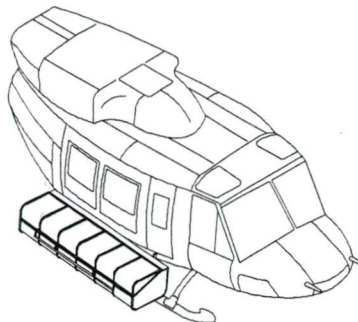


Figure 25.10 – 1006 Mega Cargo Basket Installation

Qty.	Part Number	Description
1	100601-01-XX	Mega Basket Installation, Standard Lid, Low Mounted
. 1	100605-01-XX	External Attachment Provisions Installation, Low Mounted
. 1	100610-01-XX	Mega Basket Assembly, Standard Lid
1	100601-02-XX	Mega Basket Installation, Standard Lid, High Mounted
. 1	100606-01-XX	External Attachment Provisions Installation, High Mounted
. 1	100610-01-XX	Mega Basket Assembly, Standard Lid
1	100602-01-XX	Mega Basket Installation, Extended Lid, Low Mounted
. 1	100605-01-XX	External Attachment Provisions Installation, Low Mounted
. 1	100610-02-XX	Mega Basket Assembly, Extended Lid
1	100602-02-XX	Mega Basket Installation, Extended Lid, High Mounted
. 1	100606-01-XX	External Attachment Provisions Installation, High Mounted
. 1	100610-02-XX	Mega Basket Assembly, Extended Lid

25-14 WEIGHT AND BALANCE

Two weight and balance configurations are required. The first is the installation of Attachment Provisions only. The second is Cargo Basket and Attachment Provisions as the basket may be removed or installed in the field.

1. 751 Standard Cargo Basket Configuration

Standard Units						
Part #	Name	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
75102 Attachment Provisions						
75102-01	Mounting Provisions Installation	9.6	118.3	1136.0	46.6	447.6
75110-01	Cargo Basket, Standard	49.5	119.5	5915.3	62.2	3078.9
75101-01	Basket Installation (Total)	59.1	119.3	7051.3	59.7	3526.5
100605 Low Mount Attachment Provisions						
100605-01-XX	Mounting Provisions Installation	11.2	120.6	1351.2	45.8	513.4
75110-01	Cargo Basket, Standard	49.5	121.0	5989.5	61.0	3019.5
75103-01-XX	Basket Installation (Total)	60.7	120.9	7340.7	58.2	3532.9
100606 High Mount Attachment Provisions						
100606-01-XX	Mounting Provisions Installation	11.6	124.0	1438.6	45.9	532.2
75110-01	Cargo Basket, Standard	49.5	121.3	6004.9	61.0	3019.5
75103-02-XX	Basket Installation (Total)	61.1	121.8	7443.5	58.13	3551.7

Metric Units						
Part # Name		Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
75102 Attachment Provisions						
75102-01	Mounting Provisions Installation	4.4	3002	13210	1184	5208
75110-01	Cargo Basket, Standard	22.5	3035	68288	1580	35550
75101-01	Basket Installation (Total)	26.9	3030	81498	1515	40758
100605 Low Mount Attachment Provisions						
100605-01-XX	Attachment Provisions Installation	5.1	3064	15626	1164	5936
75110-01	Cargo Basket, Standard	22.5	3073	69143	1549	34853
75103-01-XX	Basket Installation (Total)	27.6	3071	84769	1478	40789
100606 High Mount Attachment Provisions						
100606-01-XX	Attachment Provisions Installation	5.3	3150	16695	1165	6175
75110-01	Cargo Basket, Standard	22.5	3081	69323	1549	34853
75103-02-XX	Basket Installation (Total)	27.8	3094	86018	1476	41028

Note: Lateral arms are given for right side installation (XX = -02). For installation on left side (XX = -01), lateral arms are negative.

2. 955 Extra Large Cargo Basket Configuration

Standard Units						
Part #	Name	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
75102 Attachment Provisions						
75102-01	Mounting Provisions Installation	9.6	118.3	1136.0	46.6	447.6
95510-01-XX	Cargo Basket, Extra Large	66.8	111.1	7421.5	63.9	4268.5
75101-01	Basket Installation (Total)	76.4	112.0	8557.5	61.7	4715.5
100605 Low Mount Attachment Provisions						
100605-01-XX	Mounting Provisions Installation	11.2	120.6	1351.2	45.8	513.4
95510-01-XX	Cargo Basket, Extra Large	66.8	111.7	7461.6	62.7	4188.4
95502-01-XX	Basket Installation (Total)	78.0	113.0	8812.7	60.3	4701.8
100606 High Mount Attachment Provisions						
100606-01-XX	Mounting Provisions Installation	11.6	124.0	1438.6	45.9	532.2
95510-01-XX	Cargo Basket, Extra Large	66.8	111.4	7441.5	62.7	4188.4
95502-01-XX	Basket Installation (Total)	78.4	113.3	8880.2	60.2	4720.6

Metric Units						
Part #	Name	Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
75102 Attachment Provisions						
75102-01	Mounting Provisions Installation	4.4	3002	13210	1184	5208
95510-01-XX	Cargo Basket, Extra Large	30.3	2822	85507	1623	49177
95501-01-XX	Basket Installation (Total)	34.7	2845	98717	1567	54385
100605 Low Mount Attachment Provisions						
100605-01-XX	Mounting Provisions Installation	5.1	3064	15626	1164	5936
95510-01-XX	Cargo Basket, Extra Large	30.3	2837	85961	1593	48268
95502-01-XX	Basket Installation (Total)	35.4	2870	101587	1531	54204
100606 High Mount Attachment Provisions						
100606-01-XX	Mounting Provisions Installation	5.3	3150	16695	1165	6175
95510-01-XX	Cargo Basket, Extra Large	30.3	2830	85749	1593	48268
95502-01-XX	Basket Installation (Total)	35.6	2878	102444	1529	54443

Note: Lateral arms are given for right side installation (-XX = -02). For installation on left side (-XX = -01), lateral arms are negative.

3. 1006 Mega Cargo Basket Configuration

Standard Units						
Part # Name		Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
Standard Lid Configuration (Flat Lid)						
<i>100605 Low Mount Attachment Provisions</i>						
100605-01-XX	Mounting Provisions Installation	11.2	120.6	1351.2	45.8	513.4
100610-01	Mega Cargo Basket, Std. Lid	100.0	121.0	12100.0	64.7	6469.0
100601-01-XX	Basket Installation (Total)	111.2	121.0	13451.2	62.8	6982.4
<i>100606 High Mount Attachment Provisions</i>						
100606-01-XX	Mounting Provisions Installation	11.6	124.0	1438.6	45.9	532.2
100610-01	Mega Cargo Basket, Std. Lid	100.0	121.3	12131.0	64.7	6469.0
100601-02-XX	Basket Installation (Total)	111.6	121.6	13569.6	62.7	7001.2
Extended Lid Configuration (Tall Lid)						
<i>100605 Low Mount Attachment Provisions</i>						
100605-01-XX	Mounting Provisions Installation	11.2	120.6	1351.2	45.8	513.4
100610-02	Mega Cargo Basket, Ext. Lid	107.2	121.0	12971.2	65.2	6988.4
100602-01-XX	Basket Installation (Total)	118.4	121.0	14322.4	63.4	7501.8
<i>100606 High Mount Attachment Provisions</i>						
100606-01-XX	Mounting Provisions Installation	11.6	124.0	1438.6	45.9	532.2
100610-02	Mega Cargo Basket, Ext. Lid	107.2	121.3	13004.4	65.2	6988.4
100602-02-XX	Basket Installation (Total)	118.8	121.6	14443.1	63.3	7520.6

Metric Units						
Part #	Name	Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
Standard Lid Configuration (Flat Lid)						
<i>100605 Low Mount Attachment Provisions</i>						
100605-01-XX	Mounting Provisions Installation	5.1	3064	15626	1164	5936
100610-01	Mega Cargo Basket, Std. Lid	45.4	3073	139514	1643	74592
100601-01-XX	Basket Installation (Total)	50.5	3072	155140	1595	80528
<i>100606 High Mount Attachment Provisions</i>						
100606-01-XX	Mounting Provisions Installation	5.3	3150	16695	1165	6175
100610-01	Mega Cargo Basket, Std. Lid	45.4	3081	139877	1643	74592
100601-02-XX	Basket Installation (Total)	50.7	3088	156572	1593	80767
Extended Lid Configuration (Tall Lid)						
<i>100605 Low Mount Attachment Provisions</i>						
100605-01-XX	Mounting Provisions Installation	5.1	3064	15626	1164	5936
100610-02	Mega Cargo Basket, Ext. Lid	48.6	3073	149348	1656	80482
100602-01-XX	Basket Installation (Total)	53.7	3072	164974	1609	86418
<i>100606 High Mount Attachment Provisions</i>						
100606-01-XX	Mounting Provisions Installation	5.3	3150	16575	1165	6131
100610-02	Mega Cargo Basket, Std. Lid	48.6	3081	149827	1656	80515
100602-02-XX	Basket Installation (Total)	53.9	3088	166402	1608	86646

Note: Lateral arms are given for right side installation (-XX = -02). For installation on left side (-XX = -01), lateral arms are negative.

4. Options

If the basket includes any of the following options, include these corrections to the weight and balance data.

Standard Units						
Part #	Name	Weight (lbs)	Longitudinal		Lateral	
			arm (in)	moment (in-lbs)	arm (in)	Moment (in-lbs)
70407-01	Front End Cutout	-0.3	84.5	-25.4	*	*
70405-01	Lid Step (751 Basket)	5.0	119.5	597.5	*	*
70405-01	Lid Step (955 Basket)	6.5	111.1	722.2	*	*
70408-01	Hangar Wheel (751 Basket)	0.8	153.5	122.8	*	*
70408-01	Hangar Wheel (955 Basket)	0.8	153.5	122.8	*	*
70408-01	Hangar Wheel (1006 Basket)	1.6	172.0	275.2	*	*
<i>100605 Low Mount Attachment Provisions</i>						
100640-01	Step Installation (Forward)	2.0	76.2	152.4	80.9	161.7
100640-01	Step Installation (Aft)	2.0	165.8	331.6	80.9	161.7
100640-01	Step Installation (Fwd and Aft)	4.0	121.0	484.0	80.9	323.4
<i>100606 High Mount Attachment Provisions</i>						
100640-01	Step Installation (Forward)	2.0	76.5	153.0	80.9	161.7
100640-01	Step Installation (Aft)	2.0	166.1	332.2	80.9	161.7
100640-01	Step Installation (Fwd and Aft)	4.0	121.3	485.2	80.9	323.4

Metric Units						
P/N	Description	Weight (kg)	Longitudinal		Lateral	
			arm (mm)	Moment (mm-kg)	arm (mm)	Moment (mm-kg)
70406-01	Front End Cutout	-0.1	2146	-215	*	*
70405-01	Lid Step (751 Basket)	2.3	3035	6981	*	*
70405-01	Lid Step (955 Basket)	2.9	2822	8184	*	*
70408-01	Hangar Wheel (751 Basket)	0.4	3899	1560	*	*
70408-01	Hangar Wheel (955 Basket)	0.4	3899	1560	*	*
70408-01	Hangar Wheel (1006 Basket)	0.7	4369	3058	*	*
<i>100605 Low Mount Attachment Provisions</i>						
100640-01	Step Installation (Forward)	0.9	1935	1742	2054	1849
100640-01	Step Installation (Aft)	0.9	4212	3791	2054	1849
100640-01	Step Installation (Fwd and Aft)	1.8	3073	5531	2054	3698
<i>100606 High Mount Attachment Provisions</i>						
100640-01	Step Installation (Forward)	0.9	1943	1749	2054	1849
100640-01	Step Installation (Aft)	0.9	4219	3797	2054	1849
100640-01	Step Installation (Fwd and Aft)	1.8	3081	5546	2054	3698

*Note: Lateral arm is the same as the basket configuration. Lateral moment is calculated with the lateral arm.

25-15 STRUCTURAL FASTENER DATA

Refer to Bell Standard Practices Manual BHT-ALL-SPM for torque values not listed in this ICA.

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-4 TRANSPORT CATEGORY ROTORCRAFT – CAR 529

BLOCK 1

Name of the applicant for the design change approval:	Aero Design Ltd.
Description of the design change:	Installation of Mounting Provisions and Quick Release Cargo Basket on Bell 205/212/214/412
Certification Basis of design change and revision date:	FAR 29, Amendment 29-2
CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed:	Section 0-3 of Supplemental ICA (ICA 751.90, Rev. 2)
CAR Standard 513.05 (1) (g) (iv): Installation Instructions:	Installation Drawing 75101, 75103, 95501, 95502, 100601, 100602, 100605, 100606

BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.	ICA ref: Bell 205/212/214/412 Maintenance Manuals BHT-205A1-MM-1 BHT-212-MM BHT-214B-MM-1 BHT-412-MM	Supplemental ICA ref: Single Manual (ICA751.90, Rev. 2)
A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement.	ICA ref: Bell 205/212/214/412 Maintenance Manual	Supplemental ICA ref: Arranged in ATA format
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (a) Rotorcraft maintenance manual or section		
A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance.	ICA ref: Bell 205/212/214/412 Maintenance Manual Chapter 1	Supplemental ICA ref: Section 0-1

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances.	ICA ref: Bell 205/212/214/412 Maintenance Manual Chapter 1	Supplemental ICA ref: Section 0-5
A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 12	Supplemental ICA ref: N/A
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (b) Maintenance Instructions.		
A527.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 25	Supplemental ICA ref: Section 25-1 thru 25-12
A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 7 and 8	Supplemental ICA ref: Section 25-14
A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3	Supplemental ICA ref: Section 5-3
A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2	Supplemental ICA ref: Section 25-15
A527.3 (g) Special tools (g) A list of special tools needed.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3

Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

A529.4 AWL - Separate Section 1 The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under 529.571. If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 4	Supplemental ICA ref: Chapter 4
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BLOCK 4 – Applicant Statement of Compliance

The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.	
Applicants Signature: <u>Jeff Clarke</u>	Date: <u>19 December 2014</u>
Applicants Name: <u>Jeff Clarke, Vice President</u>	

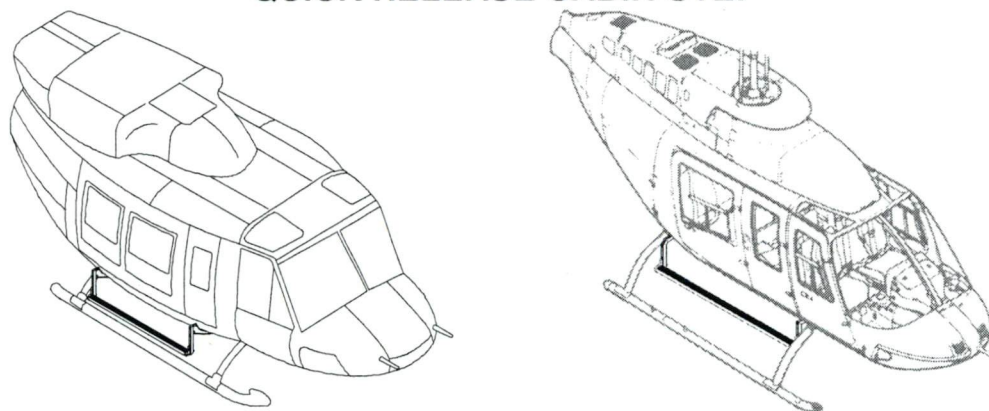
BLOCK 5 – Minister's Statement of Acceptability

The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.			
Reviewer's Name: <u>JACK STAAL</u>	Phone # <u>780-495-5227</u>	Email: <u>jack.staal@fc.gc.ca</u>	Mail Routing Symbol: <u>RAX1</u>
Signature: <u>J Staal</u>	Date: <u>6 Feb. 2015</u>	NAPA Number: <u>C-14-0978</u>	

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 800.90

**BELL 205A-1, 205B, 212, 412, 412EP, 412CF
BELL 206L SERIES, 407**

QUICK RELEASE CABIN STEP



TCCA Supplemental Type Certificate No. SH00-48, SH07-56
FAA Supplemental Type Certificate No. SR02253NY, SR02730NY
EASA Supplemental Type Certificate No. _____

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when the Quick Release Step installed in accordance with Aero Design Ltd. Document Control List DCL800-1, Revision 1, or later approved revision, or Document Control List DCL800-2, Revision 0, or later approved revision, is installed.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 3
Date: 13 January 2015

Aero Design Ltd.



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RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0	17 July 2008	(incorporated)	Original Issue
1	18 November 2008	(incorporated)	
2	2 December 2008	(incorporated)	
3	13 January 2015		

LIST OF EFFECTIVE PAGES

List of Revisions	Revision 0 (Original Issue)	17 July, 2008
	Revision 1	18 November, 2008
	Revision 2	2 December, 2008
	Revision 3	13 January 2015

List of Effective Pages

<u>Description</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	3
Revision Record/List of Effective Pages	2	3
Table of Contents	3	3
00-00-00	4	3
	5	3
04-00-00	6	3
05-00-00	7	2
	8	3
	9	3
25-50-00	10	3
	11	3
	12	3
	13	3
	14	3

NOTE

Revised text is indicated by a black vertical line. A revised page with only a vertical line next to the page number indicates that text has shifted or that non-technical correction(s) were made on that page. Insert latest revision pages; dispose of superseded pages.

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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 27/29.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Quick Release Step as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness

LH - Left Hand

RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Quick Release Step. Requests for a copy may be made in writing to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

0-5 GENERAL DESCRIPTION

The Quick Release Step installation consists of a step assembly which is attached to quick release mounting provisions installed on the helicopter. These mounting provisions are capable of mounting various equipment including cargo baskets.

The step itself consists of an aluminum extrusion welded to brackets on the ends with fittings that lock into the quick release mechanism on the mounting beams.

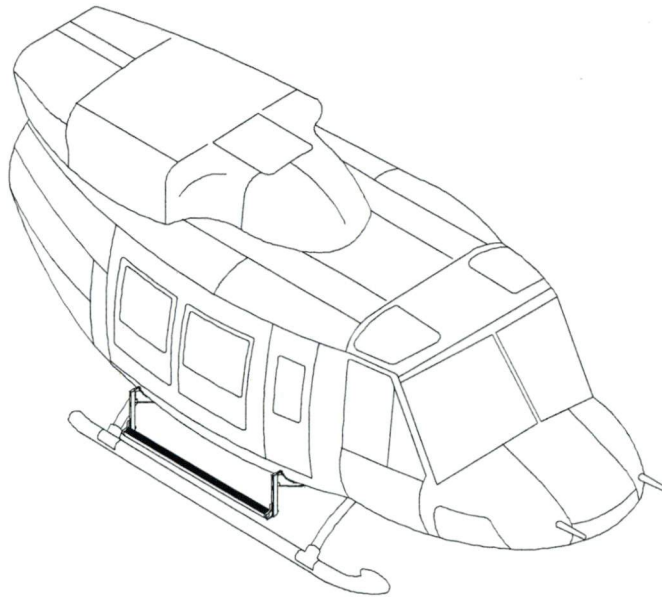


Figure 0.1 – Bell Medium Step Installation

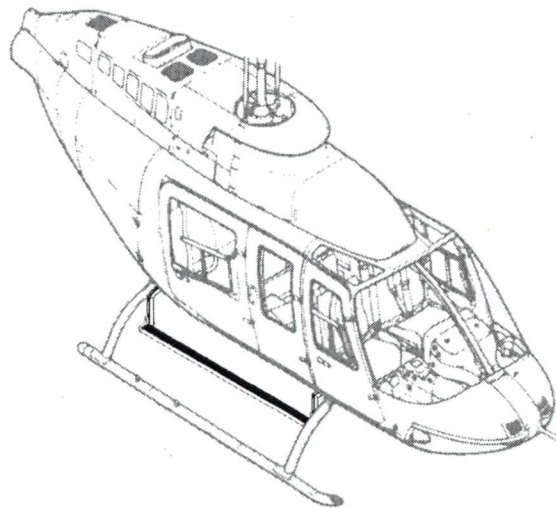


Figure 0.2 – Bell 206L / 407 Step Installation

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

FAR 29

The Airworthiness Limitations section is FAA approved and specifies maintenance required under Sections 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

FAR 27

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

EASA

The Airworthiness Limitations section is approved and variations must also be approved.

No additional airworthiness limitations have been imposed due to installation of the Quick Release Step.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of Quick Release Step.

Daily Inspection

1. Inspection Area: Step

- a) Inspect the step attachment to the beams for condition and security. Ensure quick release mechanism is completely extended, flush with the outboard surface of the beam.

300 Hour or Annual Inspection

Refer to the ICA for the Quick Release Cargo Basket for each specific model of helicopter for inspection of mounting provisions.

1. Inspection Area: Step

- a) Visually inspect welds attaching end brackets to step extrusion for cracks, corrosion or other damage.
- b) Visually inspect step for damage.
- c) Visually inspect lugs attaching the step to the beams for security and damage.

Special Inspections

Following a hard landing inspect the Quick Release Step installation in accordance with the 300 hour or annual inspection listed above.

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

Refer to the ICA for the Quick Release Cargo Basket for each specific model of helicopter for further limits and repair instructions.

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Step Assembly

Part	Type of Damage	Max. Allowable	Repair
Step End Bracket	Corrosion	0.010" deep	Blend up to 0.010" deep with scotchbrite.
	Scratches / Nicks	0.010" deep x 0.5" long	Blend up to 0.010" deep with scotchbrite.
	Cracks/Dents	None	N/A
	Bent Lugs	None	N/A
Centre Step Section	Corrosion	2" x 2" x 0.010" deep	Blend up to 0.010" deep with scotchbrite.
	Scratches / Nicks	0.010" deep x 1" long	Blend up to 0.010" deep with scotchbrite.
	Cracks / Dents	None	N/A
	Permanent Deflection of Step	0.25" max at middle of step	None

2. Steel Beams

Part	Type of Damage	Max. Allowable	Repair
Steel Beam	Corrosion	0.030" deep	Blend up to 0.030" deep with scotchbrite.
	Scratches / Nicks (Outboard face)	0.030" deep x 0.125" wide	Blend up to 0.030" deep with scotchbrite.
	Scratches / Nicks (all other sides)	0.060" deep x 0.125" wide	Blend up to 0.060" deep with scotchbrite.
	Cracks/Dents	None	N/A
	Elongation of Keyway	See figure 3	None
	Widening of slots	27/64" (0.422) diameter (check with a 27/64" drill)	None

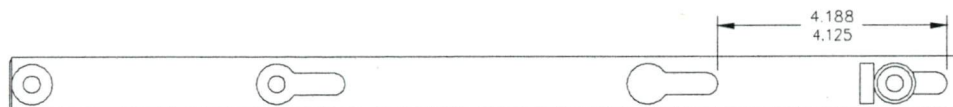


Figure 5.1 – Critical Keyway dimensions
(Bell Medium beam shown, Bell 206L/407 critical keyway same)

3. Step Welds

Cracks up to 0.25" long may be repaired as follows:

- a) Clean area of paint.
- b) Grind away weld in area of crack.
- c) T.I.G. weld per MIL-STD-2219 Class "C" using ER4043 filler rod. Do not grind flush.
- d) Touch up paint as noted in section 5-3.

5-3 PROTECTIVE TREATMENT INFORMATION

1. Step Assembly

The Step Assembly is supplied powder coated or painted. If the finish is damaged, touch up with polyurethane paint. The tread area is painted with anti-skid paint. If the anti-skid paint is damaged, touch up with Randolph X1567 Wingwalk grip paint or equivalent.

CHAPTER 25 – EQUIPMENT AND FURNISHINGS

The Quick Release Step Installation may be applied to the right and/or left side of the helicopter. A stowed position located on the inboard side of the mounting provisions is provided on some configurations. Refer to the ICA for the Quick Release Cargo Basket for each specific model of helicopter for installation and removal instructions for the mounting provisions.

25-1 STEP REMOVAL

75102 / 70102 / 70202 Mounting Provisions

Refer to Figure 25.1.

1. Pull knob at bottom end of forward beam and lift step until lower attachment fitting is free of keyway. Keep upper attachment in keyway on beam.
2. Pull knob at bottom end of aft beam and lift step until lower attachment fitting is free of keyway. Keep upper attachment in keyway on beam.
3. Lift step until upper attachments are out of keyways on both beams and remove from helicopter.

100605/100606 Mounting Provisions

Refer to Figure 25.2.

1. Pull knob at bottom end of aft beam and lift aft end of step until attachment fittings are free of keyways.
2. Slide step forward until forward attachment fittings are free of keyways and remove from helicopter.

25-2 STEP INSTALLATION

75102 / 70102 / 70202 Mounting Provisions

Refer to Figure 25.1.

1. Set upper attachment into upper keyway in forward and aft beams.
2. Lift step until lower attachment fitting hits stop. Push fitting into keyway and slide step down until locked.

100605/100606 Mounting Provisions

Refer to Figure 25.2.

1. At forward mounting beam, slide step attachment fittings into keyways on mounting beam.
2. At aft mounting beam, slide step aft and lift step until attachment fitting hits stop over keyway. Push fittings into keyways and slide step down until locked.

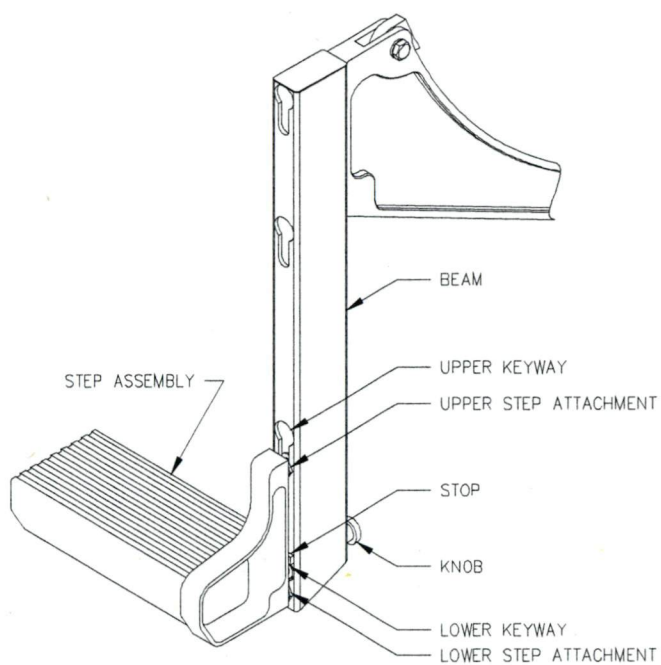


Figure 25.1 – Step Attachment
(75102 Bell 205/212/412 Attachment shown,
70102 / 70202 Bell 206L/407 Attachments same)

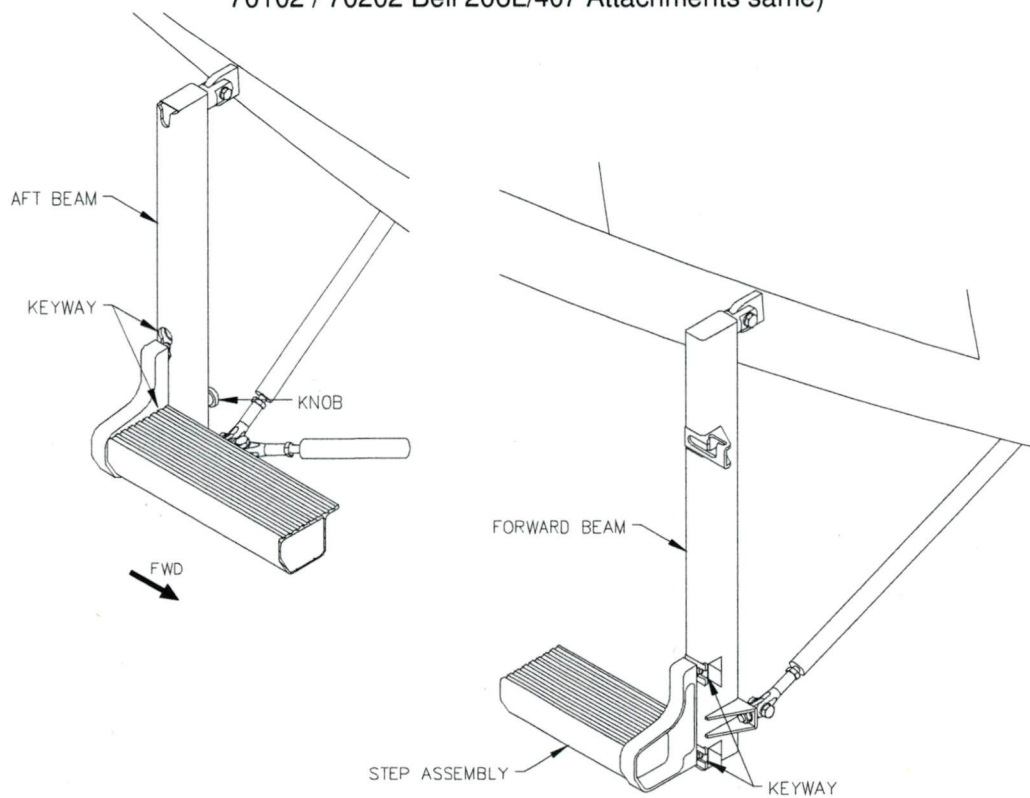


Figure 25.2 – Step Attachment
(100605 Bell 205/212/412 Attachment Shown, 100606 Attachment same)

100605 Low Mounting Provisions

Standard Units						
		Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
Part #	Name					
Step in Standard Position						
100605-01-XX	Provisions Installation	11.2	120.6	1351.2	45.8	513.4
80010-7100	Step	7.8	120.7	941.5	51.0	397.8
80003-01-XX	Step Installation (Total)	19.0	120.7	2292.6	48.0	911.2

Metric Units						
Part #	Name	Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
Step in Standard Position						
100605-01-XX	Provisions Installation	5.1	3064	15626	1164	5936
80010-7100	Step	3.5	3066	10731	1295	4533
80003-01-XX	Step Installation (Total)	8.6	3065	26357	1217	10715

Note: Lateral arms are given for right side installation (XX = 02). For installation on left side (XX = 01), lateral arms are negative.

100606 High Mounting Provisions

Standard Units						
Part #	Name	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
Step in Standard Position						
100606-01-XX	Provisions Installation	11.6	124.0	1438.6	45.9	532.2
80010-7100	Step	7.8	120.4	939.1	51.0	397.8
80003-02-XX	Step Installation (Total)	19.4	122.6	2377.8	47.9	930.0

Metric Units						
Part #	Name	Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
Step in Standard Position						
100606-01-XX	Provisions Installation	5.3	3150	16695	1165	6175
80010-7100	Step	3.5	3058	10703	1295	4533
80003-02-XX	Step Installation (Total)	8.8	3113	27398	1217	10708

Note: Lateral arms are given for right side installation (XX = 02). For installation on left side (XX = 01), lateral arms are negative.

Bell 206L Series / 407

Standard Units						
Part # Name		Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
Step in Standard Position						
70102-01	Provisions Installation (407)					
70202-01	Provisions Installation (206L)	19.9	113.3	2255.3	11.7	233.6
80010-7475	Step	8.2	114.1	935.6	29.3	239.9
80002-01	Step Installation (Total)	28.1	113.6	3190.9	16.9	473.5
Step in Stowed Position						
70102-01	Provisions Installation (407)					
70202-01	Provisions Installation (206L)	19.9	113.3	2255.3	11.7	233.6
80010-7475	Step	8.2	114.1	935.6	23.7	194.3
80002-01	Step Installation (Total)	28.1	113.6	3190.9	15.2	427.9

Metric Units						
Part # Name		Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
Step in Standard Position						
70102-01	Provisions Installation (407)					
70202-01	Provisions Installation (206L)	9.0	2878	25902	297	2673
80010-7475	Step	3.7	2898	10723	744	2753
80002-01	Step Installation (Total)	12.7	2884	36625	427	5426
Step in Stowed Position						
70102-01	Provisions Installation (407)					
70202-01	Provisions Installation (206L)	9.0	2878	25902	297	2673
80010-7475	Step	3.7	2898	10723	602	2227
80002-01	Step Installation (Total)	12.7	2884	36625	386	4900

25-4 STRUCTURAL FASTENER DATA

Refer to Standard Practices Manual for torque values not listed in this ICA.

Aero Design Mega Cargo Basket Problems and Shortcomings

While the new ski basket has quality workmanship, great features and more capacity, there are some real world operating issues and shortcomings. The bulk of the problems originate with the fact that the Ski Basket is clearly mounted too low on the aircraft. We have compiled some feedback and a perspective from the different people involved in the day-to-day usage of the basket. At this point we are just trying to work with the compromises but are debating to go back to our previous Dart Heli Utility basket due to some of our difficulties. We hope that the feedback and sharing of our ideas can help you to improve this basket, especially for the heli-skiing application. The Aero Design Mega cargo basket has potential to improve from just satisfactory to a market leader with some revisions.

Heli-Skiing Customer Perspective

While our heli skiing customer likes that there is some more space available for skis, boards and backpacks, much of that space is not useful. This is the result of the outside lift in edge that is so low, that the skis and packs are almost spilling out. The release handle's low mounting position results in the handle being buried in the snow upon landing. It also often ends up behind the pile of skis making it difficult to gain access to open. When the helicopter lands in snow deep enough to put weight on the basket, the basket distorts enough that the handle cannot be released from the plastic catches without great force. This distortion can also make it difficult to be locked closed correctly. The basket handle has been found unlatched several times after a flight. The lid overhang and basket opening are too low. The ski guides have to be hunched over or on their knees to load and unload their basket. They do between 20 and 80 loading/un-loadings procedures a day. It is very uncomfortable for them. The secondary latch system on the front of the basket is totally impractical with regard to time to accomplish the locking/unlocking task and nearly impossible with ski gloves on. The lid prop rod release is also very difficult to release with Ski gloves on. The low mounted basket fills with snow in deep snow landings and often has to be cleaned out to get the skis and packs loaded. The aft wall is not robust enough to take the beating of loading 12, 20Lb sets of skis 10 to 40 times a day. This ski loading is causing the mesh to distort and needs protection and or reinforcement.

The Good

- Increased Capacity

The Bad

- Too low lift in height *Low profile lid with longer lid prop*
- Release handle too low *Raise*
- Lid is too low over head
- Prop rod is difficult to release with gloved hand *works fine for Astar guides*
- Secondary latch is impractical to use at all. *bungee not strong enough. Did they use it.*
- Fills with snow more than competitive baskets. *liner*
- Aft wall cannot take the blow of tossing the skis in. *liner*
- Handle is very difficult to release and lock when helicopter weight distorts basket in deep snow *Raise*
- Handle prone to releasing in flight *need fix*

Heli Skiing Customer Overall rating of the Aero Design basket 4/10 compared to the Dart basket rating of 7/10

Pilot Perspective

The overall view of the basket from a pilot prospective is satisfactory. The extra size does not seem to effect flight characteristics any different from other baskets. The loads being put in the basket do not feel any different to the weight and balance of the aircraft compared to competitive baskets. The quick release mounting is simple and effective means for removal. The lower overall weight compared to competitor baskets is always a bonus. The low mounting of the basket seems to not allow the aircraft to settle into the snow as well as other baskets. When the aircraft is landed with a forward motion into the snow, a common "drive in" landing, the basket plows snow and digs in. With the impractical secondary latch removed there is no visual way of knowing the basket is locked. The basket fills with snow easily and needs to be removed (sometimes by the pilot before the guides get there).

The Good

- Very little effects to flight characteristics compared to competitor baskets.
- Light weight
- Quickly removed.

The Bad

- Does not let aircraft settle into the snow *Raise*
- Digs into the snow when landing with forward movement *Raise*
- Fills with snow *liner/Raise*
- No visual way of knowing basket is locked and safe from pilot position *locking feature provided did.*
- Basket prone to unlatching in flight *Need fix*

Pilot Perspective Overall rating of the Aero Design basket 7.5/10 compared to the Dart basket rating 9.5/10

Aircraft Maintenance Engineer Perspective

From an A.M.E. point of view there are some good ideas with the basket. The quick mounting system is simple and effective. The downside of it is that the aft provision still has to be removed or moved to install the ground handling wheels. The vertical beam provisions are sturdy and pretty easy to adjust into position but they are very close to the door where they extend above the cargo floor level. The basket is light and easy to handle for the installation and removal. The lightweight of the structure comes at a cost to durability. The bottom corner of the basket mesh where it transitions from horizontal to vertical is getting pushed in and dented. These dents are pushed in from the snow and ice crust as well as the ski pile that the pilot is landing next to. We have been pushing the dents back out often. The low mounting of the basket pushes the basket deep in the snow and puts a large amount of aircraft weight loading on the basket. This loading distorts the basket out of shape and also applies a very heavy load on the aircraft hardpoints. The aircraft

weight is sitting on the basket rather than the belly in deep snow. The basket does not have the strength to support thousands of pounds of aircraft weight. We are also finding that the aft wall of the basket mesh is being pushed out and beaten from ski guides tossing the skis into the basket. The rubber bumpers that are installed into the lid to cushion between the lid and base of the basket were ripped off and or torn in only a week worth of use. The prop rod assemble has been bending from use and has had to be straightened out.

The Good

- Easy to install.
- Quick release removal with option for flight step
- Quality workmanship
- Light weight and easy to handle

Raise basket
change handle
brackets

The Bad

- Mesh pushing in on outside lower corner from snow *Raise/Liner*
- Aft wall can't take the long term beating from ski loading *Liner*
- Basket mounted too low on aircraft *Raise*
- Aft provisions need to be removed for ground handling wheels. *We knew that*
- Too much aircraft weight being put onto hardpoints *Raise*
- Too much aircraft weight being put on basket. *Raise*
- Mounting provisions too close to door where they extend above the cargo floor *We knew that*
- Prop rod not that durable and difficult to use *Works fine on the hundreds we have out there*

AME Perspective Overall rating of the Aero Design basket 5/10 compared to the Dart basket rating 9/10

Solutions

For us to be able to continue using the basket with our skiing customer we have had to come up with some short-term solutions.

- The secondary safety latch system was removed pretty much immediately as it is nearly impossible to use with gloves and not practical for 20 to 80 procedures a day.
- To open the lid further and to give the guides some more headroom, the prop rod lock hole has been welded shut and a new hole has been drilled approx. 1" farther. This lets the lid open approximately 3" or 4" farther.
- Unfortunately the results of opening the lid further has lead to the lid very lightly touching the cargo door under the right conditions. If the aircraft has landed in snow deep enough to put load on the basket it pushes the lid closer to the door. To solve this problem a piece of aluminum flat-bar stock was fabricated into a sliding limiter that was attached to the aft side of the basket to limit the max amount the lid can open. It is attached to the aft prop rod provisions. Having a slight amount of tension from that limiter on the lid while locked has also stabilized and stopped the lid from bouncing while the machine is running or idling on the ground with the basket opened.
- To allow the guides to unlock the prop rod easier when closing the basket we have welded a tab that is large enough for them to pull back on with a gloved hand.

- To give some added safety and prevent the basket from opening in flight new plastic blocks were shaped and added next to the outside two handle lock blocks. The extra plastic blocks have much more hook on them so that the handle would have to be pulled to nearly the maximum pulled position for the bar to clear. In subsequent operations they have caught the grab handle and prevented the basket opening during our multiple situations of unlatching in flight.
- After finding the basket unlatched multiple times a new bungee style secondary latch was added to the front of the basket within view of the pilot.
- To protect the aft mesh wall a piece of 3/32" plastic has been attached to help spread the load and prevent dents.

Future Revision

Without significant change our heli skiing customer will want us to return to the Dart Utility basket rather than the Aero Design mega basket. In operations, the only significant deficiency with the Dart basket is space. The much needed space of the Aero Design basket comes with compromise. After our experience and usage we have come up with some suggestions of solutions for revisions that we believe will be necessary to use this basket, specifically for Heli-skiing applications, in the future.

- First and foremost the basket must be mounted higher on the airframe. With the helicopter in normal heli skiing trim (low landing gear) and the normal heli skiing operations the basket is just too low. The helicopter needs to be able to land in deep snow and support itself with the weight on the skids, bear paws and belly of the aircraft. Too much of the aircraft weight is being put onto the basket. The low mounting is also affecting (Run in/Drive in) landings as it digs into the snow too much. Basket needs to be mounted at least 6" to 8" higher on airframe. (The Dart Basket is 7" higher to the bottom side)
- While the low lift in height of the outside edge of the basket can be handy for lifting in large and heavy cargo, it is not ideal in a skiing application. The low opening makes for an uncomfortable (hunched over) working position for the guides. To add to that, the amount of overhang that it creates with the lid, cuts into head clearance. The skis and packs are near spilling out at all times. That outside edge should be raised to nearly flat with the inboard edge or maybe a max of a 3" drop from that edge. Raising the outside lift in edge 6" to 8" would be ideal. This will also help with head clearance as that material can be removed from the lid. Overall basket profile is ok as is. It just needs some volume taken from the lid and put into a more useful place, the basket itself. Lifting the basket assembly overall and the outside lift in edge will also get the latch handle out of the snow and above the pile of skis to make it easier to open and load the basket.
- The secondary latch system should be scrapped all together.
- If a secondary latch system is requested a simple and inexpensive bungee is all that is needed and would be easy to make provisions for.
- The lid latch handle plastic blocks need more "hook" on them for a secondary safety catch. Maybe with less weight on the basket and less distortion the bar will be easier to latch and unlatch. The Grab handle does not necessarily need to be as wide as it is.

- Better yet, a completely different latch handle system might be more appropriate for a basket and lid of this size. It may be effective on a smaller "light helicopter" basket but is not rock solid on a basket with this size and flexibility.
- The prop rod release button needs to be easily released with a gloved hand (the tab welded to it works very well)
- The prop rod assembly does not seem to be very durable for the weight of a lid this large. A more robust unit might something to consider with the high usage of heli skiing.
- The simple and durable design of the Dart prop rod might be worth a consideration.
- Make sure the lid can open the maximum amount available without contact with airframe.
- A limiting slide assembly should be considered for the aft side as it really stabilizes the floppy bouncing lid while the machine is running.
- Some added tubing should be run for and aft at mid point of curve on lower basket mesh to prevent basket from being pushed in so easy in the corners.
- Some added tubing should be considered on the forward and aft walls to help prevent cargo from bulging and detaching the mesh.
- Options for plastic protection material should be considered to prevent damage from repetitive blows of cargo on the forward and aft walls. In skiing application the wooden ski flags are kept in the bottom of the basket and comfortably protect the bottom.
- If the outside edge were raised there would be no need for the extra volume of the high volume lid. A full complement of skis/boards and packs is already comfortably lower than the height of the high volume lid. This would help to keep the door opening more accessible for emergency exit when the basket is mounted higher on the airframe.

Trunt told us to get it as low as possible.

Other guides said ~~get~~ the lip lower because people are ~~hurt~~ hurting their backs due to lifting.

We were not informed the machine would be on low gear until flight testing

Lid prop was modified by your guys allowing lid to open further hitting the fuselage.

We were given no feedback till now.

We were told handle opens when landing in ~~st~~ snow.

Aero Design Mega Cargo Basket Problems and Shortcomings

While the new ski basket has quality workmanship, great features and more capacity, there are some real world operating issues and shortcomings. The bulk of the problems originate with the fact that the Ski Basket is clearly mounted too low on the aircraft. We have compiled some feedback and a perspective from the different people involved in the day-to-day usage of the basket. At this point we are just trying to work with the compromises but are debating to go back to our previous Dart Heli Utility basket due to some of our difficulties. We hope that the feedback and sharing of our ideas can help you to improve this basket, especially for the heli-skiing application. The Aero Design Mega cargo basket has potential to improve from just satisfactory to a market leader with some revisions.

Heli-Skiing Customer Perspective

While our heli skiing customer likes that there is some more space available for skis, boards and backpacks, much of that space is not useful. This is the result of the outside lift in edge that is so low, that the skis and packs are almost spilling out. The release handle's low mounting position results in the handle being buried in the snow upon landing. It also often ends up behind the pile of skis making it difficult to gain access to open. When the helicopter lands in snow deep enough to put weight on the basket, the basket distorts enough that the handle cannot be released from the plastic catches without great force. This distortion can also make it difficult to be locked closed correctly. The basket handle has been found unlatched several times after a flight. The lid overhang and basket opening are too low. The ski guides have to be hunched over or on their knees to load and unload their basket. They do between 20 and 80 loading/un-loadings procedures a day. It is very uncomfortable for them. The secondary latch system on the front of the basket is totally impractical with regard to time to accomplish the locking/unlocking task and nearly impossible with ski gloves on. The lid prop rod release is also very difficult to release with Ski gloves on. The low mounted basket fills with snow in deep snow landings and often has to be cleaned out to get the skis and packs loaded. The aft wall is not robust enough to take the beating of loading 12, 20Lb sets of skis 10 to 40 times a day. This ski loading is causing the mesh to distort and needs protection and or reinforcement.

The Good

- Increased Capacity

The Bad

- Too low lift in height
- Release handle too low
- Lid is too low over head
- Prop rod is difficult to release with gloved hand
- Secondary latch is impractical to use at all.
- Fills with snow more than competitive baskets.
- Aft wall cannot take the blow of tossing the skis in.
- Handle is very difficult to release and lock when helicopter weight distorts basket in deep snow
- Handle prone to releasing in flight

Heli Skiing Customer Overall rating of the Aero Design basket 4/10 compared to the Dart basket rating of 7/10

Pilot Perspective

The overall view of the basket from a pilot prospective is satisfactory. The extra size does not seem to effect flight characteristics any different from other baskets. The loads being put in the basket do not feel any different to the weight and balance of the aircraft compared to competitive baskets. The quick release mounting is simple and effective means for removal. The lower overall weight compared to competitor baskets is always a bonus. The low mounting of the basket seems to not allow the aircraft to settle into the snow as well as other baskets. When the aircraft is landed with a forward motion into the snow, a common "drive in" landing, the basket plows snow and digs in. With the impractical secondary latch removed there is no visual way of knowing the basket is locked. The basket fills with snow easily and needs to be removed (sometimes by the pilot before the guides get there).

The Good

- Very little effects to flight characteristics compared to competitor baskets.
- Light weight
- Quickly removed.

The Bad

- Does not let aircraft settle into the snow
- Digs into the snow when landing with forward movement
- Fills with snow
- No visual way of knowing basket is locked and safe from pilot position
- Basket prone to unlatching in flight

Pilot Perspective Overall rating of the Aero Design basket 7.5/10 compared to the Dart basket rating 9.5/10

Aircraft Maintenance Engineer Perspective

From an A.M.E. point of view there are some good ideas with the basket. The quick mounting system is simple and effective. The downside of it is that the aft provision still has to be removed or moved to install the ground handling wheels. The vertical beam provisions are sturdy and pretty easy to adjust into position but they are very close to the door where they extend above the cargo floor level. The basket is light and easy to handle for the installation and removal. The lightweight of the structure comes at a cost to durability. The bottom corner of the basket mesh where it transitions from horizontal to vertical is getting pushed in and dented. These dents are pushed in from the snow and ice crust as well as the ski pile that the pilot is landing next to. We have been pushing the dents back out often. The low mounting of the basket pushes the basket deep in the snow and puts a large amount of aircraft weight loading on the basket. This loading distorts the basket out of shape and also applies a very heavy load on the aircraft hardpoints. The aircraft

weight is sitting on the basket rather than the belly in deep snow. The basket does not have the strength to support thousands of pounds of aircraft weight. We are also finding that the aft wall of the basket mesh is being pushed out and beaten from ski guides tossing the skis into the basket. The rubber bumpers that are installed into the lid to cushion between the lid and base of the basket were ripped off and or torn in only a week worth of use. The prop rod assembly has been bending from use and has had to be straightened out.

The Good

- Easy to install.
- Quick release removal with option for flight step
- Quality workmanship
- Light weight and easy to handle

The Bad

- Mesh pushing in on outside lower corner from snow
- Aft wall can't take the long term beating from ski loading
- Basket mounted too low on aircraft
- Aft provisions need to be removed for ground handling wheels.
- Too much aircraft weight being put onto hardpoints
- Too much aircraft weight being put on basket.
- Mounting provisions too close to door where they extend above the cargo floor
- Prop rod not that durable and difficult to use

AME Perspective Overall rating of the Aero Design basket 5/10 compared to the Dart basket rating 9/10

Solutions

For us to be able to continue using the basket with our skiing customer we have had to come up with some short-term solutions.

- The secondary safety latch system was removed pretty much immediately as it is nearly impossible to use with gloves and not practical for 20 to 80 procedures a day.
- To open the lid further and to give the guides some more headroom, the prop rod lock hole has been welded shut and a new hole has been drilled approx. 1" farther. This lets the lid open approximately 3" or 4" farther.
- Unfortunately the results of opening the lid further has lead to the lid very lightly touching the cargo door under the right conditions. If the aircraft has landed in snow deep enough to put load on the basket it pushes the lid closer to the door. To solve this problem a piece of aluminum flat-bar stock was fabricated into a sliding limiter that was attached to the aft side of the basket to limit the max amount the lid can open. It is attached to the aft prop rod provisions. Having a slight amount of tension from that limiter on the lid while locked has also stabilized and stopped the lid from bouncing while the machine is running or idling on the ground with the basket opened.
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Transport
Canada

Transports
Canada

1100 9700 Jasper Avenue NW
Edmonton, Alberta, T5J 4E6
Canada

Your file Votre référence

SR02730NY
Our file Notre référence

8 June 2015

C-15-0512
SH07-56, Iss. 3

Department of Transportation
Federal Aviation Administration
New York Aircraft Certification Office ANE-170
1600 Stewart Avenue, Suite 410
Westbury, NY, 11590
USA

Attention: Mr Gaetano Sciortino

Subject: STC SH07-56 Issue 3, Bell Helicopter 205/212/412, Installation of Quick Release Cargo Basket, Reissue of FAA STC SR02730NY, Aero Design Ltd.

We have received an application from a Canadian company, Aero Design Ltd., for the reissue of a Canadian Supplemental Type Certificate and reissue of the FAA STC SR02730NY for amendments to the Quick Release Cargo Basket installation on the Bell 205/212/412 helicopters.

This reissue updates the address for Aero Design Ltd. The reissue also adds two basket configurations, models 955 and 1006, adds a mounting configuration option for the previous 751 basket, adds step mounting options, and includes drawing updates and clarifications. Note the added baskets, models 955 and 1006, are not presently eligible on the 412 series. The STC Certificate with relevant Installation and FMS documents reference this.

We have reviewed the applicant's submission and certify that the design change complies with the basis of certification specified in Canadian Type Certificates H-104 and H-86, and FAA Type Certificate H1SW. We have issued STC SH07-56 Iss 3 dated February 6, 2015.

We also confirm that compliance is demonstrated with FAA Type Certificates H1SW and H4SW unless additional technical conditions are applied by the FAA.

"In accordance with the FAA Memorandum on Deviation Request to FAA Order 8110.4C, 8110.115, and 8110.54A dated October 9, 2012, TCCA confirms that ICAs

Canada

related to this STC application meet the content and format of MSI 53 (determined to be equivalent to FAA Order 8110.54, 14 CFR 23.1529, 25.1529, 27.1529, 29.1529, 25.1729,2/

31.82, 33.4 Part 26 as appropriate) and, that TCCA will take appropriate corrective actions for any ICA issues related to this STC which may arise during post-certification sampling to be conducted by the FAA."

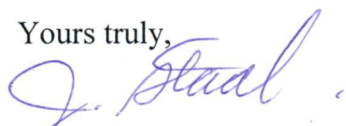
Please consider this to be a formal application for an FAA STC reissue under the provisions of the Canada/U.S. Bilateral Airworthiness Agreement.

In support of this application documentation per the enclosed Aero Design Ltd letter of 13 April 2015 is attached. Soft copies of the documents are included on the enclosed CD.

The original of FAA STC SR02730NY Issued September 11, 2009 with the transfer endorsement completed is also enclosed with this package. (This transfer protocol was FAA requested for a previous FAA STC reissue application for Aero Design Ltd and thus has been completed herewith as well.)

Please contact the undersigned if needed.

Yours truly,



J. Staal
Certification Technologist
Engineering, Edmonton
Prairie and Northern Region
780-495-5227
jack.staal@tc.gc.ca

Enclosure(s)

cc: Aero Design Ltd., Powell River, B.C.



13 April 2015

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File :
Our File : 1006

Re: Bell 205/212/412 Cargo Baskets – FAA STC Amendment

Jack,

Please find attached the following documents in support of application for revision to
FAA STC SR02730NY:

Modification Approval Request Application Form		
FAA STC Application Form 8110-12		
FAA STC – New address and transfer endorsed	SR02730NY	Original
Letter authorizing transfer endorsement of STC		
Transport Canada STC	SH07-56	Issue 3
Certification Plan	CP1006	Rev. 1
Instructions for Continued Airworthiness	ICA751.90	Rev. 2
MSI 53 Review for ICA751.90		
Flight Manual Supplement	FMS751.91	Rev. 2
Document Control List (Std. Basket Installation)	DCL751-1	Rev. 2
Cargo Basket Installation	75101	Rev. 2
Cargo Basket Installation (Alternate)	75103	Rev. 0
Document Control List (Std. Basket Fabrication)	DCL751-2	Rev. 1
Cargo Basket Assembly	75110	Rev. 1
Basket Fabrication	75111	Rev. 1
Lid Fabrication	75112	Rev. 1
End Hoop	75121	Rev. 2
Placard	75127	Rev. 1
Lugs	75129	Rev. 2
Document Control List (Provisions Fabrication)	DCL751-3	Rev. 2
Forward Beam Assembly	75115	Rev. 1
Aft Beam Assembly	75116	Rev. 1
Forward Beam	75130	Rev. 1
Aft Beam	75131	Rev. 1
Tube Assembly	75132	Rev. 3
Document Control List (Provisions Installation)	DCL751-4	Rev. 0
Mounting Provisions Installation	75102	Rev. 1



Document Control List (Cabin Step Installation)	DCL800-1	Rev. 1
Cabin Step Installation	80001	Rev. 1
Cabin Step Installation (Alternate)	80003	Rev. 0
Instructions for Continued Airworthiness	ICA800.90	Rev. 3
MSI 53 Review for ICA800.90		
Document Control List (Cabin Step Assembly)	DCL800-11	Rev. 1
Step Assembly	80010	Rev. 2
Step End Fabrication	80020	Rev. 1
Document Control List (Long Basket Installation)	DCL955-3	Rev. 0
Cargo Basket Installation	95501	Rev. 1
Cargo Basket Installation (Alternate)	95502	Rev. 0
Document Control List (Long Basket Assembly)	DCL955-2	Rev. 2
Cargo Basket Assembly	95510	Rev. 1
Basket Fabrication	95511	Rev. 1
Lid Fabrication	95512	Rev. 1
Attachment Hoop	95523	Rev. 1
End Hoop	95524	Rev. 1
Placard	95527	Rev. 2
Document Control List (Mega Basket Installation)	DCL1006-1	Rev. 0
Cargo Basket Installation (Standard Lid)	100601	Rev. 0
Cargo Basket Installation (Extended Lid)	100602	Rev. 0
Option – Step Modification Installation	100640	Rev. 0
Document Control List (Mega Basket Assembly)	DCL1006-11	Rev. 0
Cargo Basket Assembly	100610	Rev. 0
Basket Fabrication	100611	Rev. 0
Standard Lid Fabrication	100612	Rev. 0
Extended Lid Fabrication	100613	Rev. 0
Filler Sheet	100616	Rev. 0
Standard Hoop	100620	Rev. 0
End Hoop	100621	Rev. 0
Attachment Hoop	100622	Rev. 0
Standard Lid Hoop	100623	Rev. 0
Standard Lid End Hoop	100624	Rev. 0
Extended Lid Hoop	100625	Rev. 0
Extended Lid End Hoop	100626	Rev. 0
Placard	100627	Rev. 0
Step Assembly	100650	Rev. 0
Engineering Report	ER1006.01	Rev. 0
Load Test Plan and Report	TR1006.02	Rev. 0
Flight Test Plan and Report	FTP1006.03	Rev. 0
Flight Test Report - TCCA	N/A	14/11/2014
Document Control List (Provisions Installation)	DCL1006-2	Rev. 0
Mounting Provisions Installation (Low)	100605	Rev. 0
Mounting Provisions Installation (High)	100606	Rev. 0



Aero Design Ltd.
604-483-AERO (2376)

9888A Malaspina Road
Powell River, BC, Canada, V8A 0G3

Document Control List (Mega Basket Assembly)	DCL1006-12	Rev. 0
Forward Beam Fabrication (Low)	100630	Rev. 0
Aft Beam Fabrication (Low)	100631	Rev. 0
Forward Beam Fabrication (High)	100632	Rev. 0
Aft Beam Fabrication (High)	100633	Rev. 0
Struts Fabrication	100635	Rev. 0
 Document Control List (Modifications)	 DCL704	 Rev. 10
Front End Cutout – AS350 / AS355	70407	Rev. 1
(remainder of drawings on this DCL submitted with amendment to STC SR02991NY)		

A CD with the above data is included for submission to the FAA. Paper copies of common component drawings (drawings 362XX and 842XX) used on all Aero Design baskets, listed on the assembly DCLs, are not included with this submission. Paper copies are available on request.

Regards,

Jeff Clarke, P.Tech.(Eng.)
Vice President

Encl.



Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3

Tel: 604.483.2376
Fax: 604.483.2372
www.aerodesign.ca

13 April 2015

Department of Transportation
Federal Aviation Administration
New York Aircraft Certification Office ANE-170
1600 Stewart Avenue, Suite 410
Westbury, NY, 11590
USA

Attention: Mr. Ray Reinhardt, Program Manager.

Re: FAA SR02730NY, Bell Medium Helicopter Cargo Basket Installation

Please find enclosed original US STC SR02730NY, endorsed on the back with the new address for Aero Design Ltd. Mr. Clarke is vice president of Aero Design Ltd. and as such is authorized to make this endorsement on behalf of the company.

If you need anything further please feel free to contact me.

Regards,

Jason Rekve
President

Encl.

CC: Jack Staal, Transport Canada



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

FORM APPROVED
OMB No. 2120-0018
EXP DATE: 11/30/2013

APPLICATION FOR TYPE CERTIFICATE, PRODUCTION CERTIFICATE, OR SUPPLEMENTAL TYPE
CERTIFICATE

1. Name Of Applicant Aero Design Ltd.		2. Application made for : <input type="checkbox"/> Type Certificate <input type="checkbox"/> Production Certificate <input type="checkbox"/> Supplemental Type Certificate <input type="checkbox"/> Amended Type Certificate <input checked="" type="checkbox"/> Amended Supplemental Type Certificate		3. Product Involved <input checked="" type="checkbox"/> Aircraft <input type="checkbox"/> Engine <input type="checkbox"/> Propeller	
4. Address 9888A Malaspina Road		b. City State Powell River BC, Canada		c. Zip Code V8A 0G3	
5. TYPE CERTIFICATE (Complete item 5a below)					
a. Model designation(s) (All models listed are to be completely described in the required technical data, including drawings representing the design, material, specifications, construction, and performance of the aircraft, aircraft engine, propeller which is the subject of this application.)					
6. PRODUCTION CERTIFICATE (Complete items 6a-c below. Submit with this form, in manual form, one copy of quality control data or changes thereto covering new products, as required by applicable FAR.)					
a. Factory address (if different from above)		b. Application is for <input type="checkbox"/> New production certificate <input type="checkbox"/> Additions to production Certificate (Give P.C. No.)		P.C. No.	
c. Applicant is holder of or a licensee under a Type Certificate or a Supplemental Type Certificate (Attach evidence of licensing agreement and give certificate number)				T.C./S.T.C. No.	
7. SUPPLEMENTAL TYPE CERTIFICATE (Complete items 7a-d below)					
a. Make and model designation of product to be modified Bell Helicopter Textron Inc. 205A-1, 205B, 212, 412, 412EP, 412CF					
b. Description of modification Amend STC SR02730NY - External Cargo Basket and Cabin Steps Installation: Installation of mounting provisions on the fuselage; installation of quick release cargo basket (3 sizes) on mounting provisions; installation of cabin step on mounting provisions. Amendment is to update holder address, add configurations and model 205B. See CP1006 Rev. 1 for details.					
c. Will data be available for sale or release to other persons? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		d. Will parts be manufactured for sale? (Ref. FAR 21.303) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
8. CERTIFICATION - I certify that the above statements are true. <input checked="" type="checkbox"/>					
Signature of certifying official 		Title Vice President		Date 13 April 2015	



DESIGN CHANGE APPROVAL APPLICATION

DEMANDE D'APPROBATION D'UNE MODIFICATION DE LA CONCEPTION

Legal name and address of applicant Nom et adresse légal du demandeur Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3		Legal name and address of prospective holder Nom et adresse légal du titulaire éventuel Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3		Name and address for billing purposes (if different than applicant) Nom et adresse aux fins de facturation (si différent du demandeur)	
Identification of aeronautical product / Identification du produit aéronautique					
Make / Marque Bell		Model / Modèle 205/212/412		Registration / Immatriculation All eligible	
				Serial No. / N° du série All eligible	
				Part No. / N° de la pièce	
Request for (check appropriate box) / Objet de la demande (Cochez les carrés selon le cas)				Type Design Examination by Foreign Authority Examen de la définition de type par autorité étrangère	
<input type="checkbox"/> STC CTS <input type="checkbox"/> STC (single serial number) CTS (numéro de série simple) <input type="checkbox"/> STC (multiple serial numbers) CTS (numéros de série multiples) <input type="checkbox"/> Type Certificate Revision Revision de certificat de type <input checked="" type="checkbox"/> Revision Révision				<input type="checkbox"/> Repair Design Approval (RDA) Approbation de la conception de réparation (ACR) <input type="checkbox"/> Repair Design Approval - Process Repair ACR - Processus de réparation <input type="checkbox"/> Part Design Approval (PDA) Approbation de la conception de pièce (ACP) <input checked="" type="checkbox"/> Application to a foreign authority is requested La demande à une autorité étrangère est demandée. <input type="checkbox"/> Type design examination of foreign change Examen de la définition de type modification étrangère	
No. SH07-56 N°				Current Issue 3 Édition active	
<input type="checkbox"/> Restricted Category Catégorie restreinte					
Type of Operation Type d'opération					
Title and brief description of modification, repair or replacement part, including effects of changes (use additional pages if necessary). Refer to CAR 521.155(b)(i) for details. Titre et brève description de la modification, de la réparation ou de la pièce de rechange, y compris les effets des changements (utiliser des feuilles supplémentaires si nécessaire). Référez-vous à RAC 521.155(b)(i) pour des détails. External Cargo Basket and Cabin Steps Installation Installation of mounting provisions on the fuselage; installation of quick release cargo basket on mounting provisions; installation of cabin step on mounting provisions. See CP1006 Rev. 1.					
Applicable Type Certificate (TC) / Certificat de type (CT) pertinent					
TC No. / N° de CT H1SW, H-86 (H4SW), H-104		Issue No. / N° de l'édition 24, 12 (29), 3		Identify State of Design / Identifier l'état de conception FAA	
The applicant is responsible for the control of product manufacture / Le demandeur est responsable du contrôle de la fabrication du produit					
<input checked="" type="checkbox"/> Yes Oui					
<input type="checkbox"/> No Non					
If no, identify who is responsible Si non, identifier qui est responsable					
Documentation to be submitted Documentation à soumettre				Applicant Demandeur	
				Submitted Soumis	
				Yes Oui	
				No Non	
Proposed certification basis Proposition de base de certification				<input checked="" type="checkbox"/>	
Certification plan in accordance with CAR 521.155(d) Plan de certification selon RAC 521.155(d)				<input checked="" type="checkbox"/>	
Applicant's remarks / Remarques du demandeur Amendment is to update holder, add 2 new configurations, and add 205B model.					
I hereby certify that the information contained herein is correct and complete. I agree to pay charges as prescribed in Part 1, Subpart 4 of the CARs (CAR 104-Charges). Je certifie que les renseignements figurant ci-dessus sont exacts et complets. Je m'engage à payer les redevances prescrites à la sous-partie 4 de la partie I du RAC (sous-partie 104 du RAC - Redevances).					
JEFF CLARKE Name and Signature of Applicant / Nom et signature du demandeur		VICE PRESIDENT Title / Poste		2015-04-13 Date (yyyy-mm-dd) / Date (aaaa-mm-jj)	



Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, British Columbia
Canada V8A 0G3

Number: SH07-56

Issue No.: 3

Approval Date: December 24, 2007

Issue Date: February 06, 2015

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

Bell 205A-1, 205B, 212, 412, 412 CF, 412 EP

Canadian Type Certificate or Equivalent:

H-104 (Bell 205B)
H-86 (Bell 212, 412, 412 CF, 412 EP)
H1SW (Bell 205A-1)

Description of Type Design Change:

Installation of Quick Release Mounting Provisions/Cargo Basket/Step on the right side or the left hand side of the helicopter.

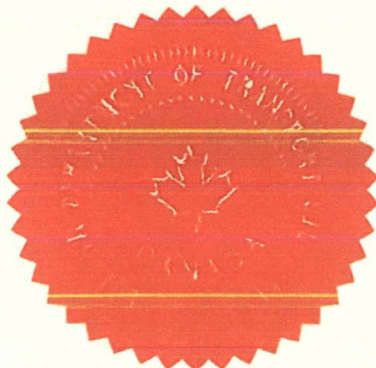
Installation/Operating Data,
Required Equipment and Limitations:

Configuration A - Quick Release Mounting Provisions:

Installation of Quick Release Mounting Provisions to be accomplished in accordance with Transport Canada Civil Aviation (TCCA) approved Aero Design Ltd., Document Control List DCL751-4, Revision 0, dated 13 January 2015, or later TCCA approved revision.

Quick Release Mounting Provisions may remain installed if any other configuration is removed.

...See Continuation Sheet



Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

F.J.B. Wright
For Minister of Transport



NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Configuration B - Quick Release Cargo Basket Installation (Standard Basket):

Installation of Configuration A or E - Quick Release Mounting Provisions is a mandatory prerequisite for installation of Configuration B. Installation of Quick Release Cargo Basket to be completed in accordance with TCCA approved, Aero Design Ltd. Document Control List, DCL751-1, Revision 2, dated 13 January 2015, or later approved revision.

Configuration C - Quick Release Step Installation:

Installation of Configuration A or E - Quick Release Mounting Provisions is a mandatory prerequisite for installation of Configuration C. Installation of Quick Release Step to be completed in accordance with TCCA approved, Aero Design Ltd. Document Control List, DCL800-1, Revision 1, dated 13 January 2015, or later approved revision.

Maintenance of the Quick Release Step Installation must be in accordance with TCCA accepted, Aero Design Ltd. Instructions for Continued Airworthiness ICA800.90, Revision 3, dated 13 January 2015, or later TCCA accepted revision.

Configuration D - Quick Release Cargo Basket Installation (Extra Large Basket):

This configuration is not eligible on Bell 212, 412EP, 412CF.

Installation of Configuration A or E - Quick Release Mounting Provisions is a mandatory prerequisite for installation of Configuration D. Installation of Quick Release Cargo Basket to be completed in accordance with TCCA approved, Aero Design Ltd. Document Control List, DCL955-3, Revision 0, dated 13 January 2015, or later a approved revision.

Configuration E - Quick Release Mounting Provisions (Alternate):

Installation of quick Release Mounting Provisions to be completed in accordance with TCCA approved, Aero Design Ltd. Document Control List, DCL1006-2, Revision 0, dated 16 January 2015, or later approved revision.

Quick Release Mounting Provisions may remain installed if any other configuration is removed.

...See Continuation Sheet



NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Configuration F - Quick Release Cargo Basket Installation (Mega Basket):

This configuration is not eligible on Bell 412, 412EP, 412CF.

Installation of Configuration E - Quick Release Mounting Provisions is a mandatory prerequisite for installation of Configuration F. Installation of Quick Release Cargo Basket is to be completed in accordance with TCCA approved, Aero Design Ltd. Document Control List, DCL1006-1, Revision 0, dated 16 January 2015, or later approved revision.

Cargo Basket Modifications:

Modifications to the cargo basket configuration are eligible in accordance with TCCA approved, Aero Design Ltd. Document Control List DCL704, Revision 10, dated 18 December 2014, or later approved revision. Eligibility limitations are noted on the drawings.

Data Pertinent to All Configurations:

Operation of the Quick Release Mounting Provisions, Quick Release Cargo Basket Installations, and Quick Release Cabin Steps must be in accordance with TCCA approved, Aero Design Ltd. Flight Manual Supplement FMS751.91, Revision 2, dated 24 December 2014, or later approved revision.

Maintenance of the Quick Release Mounting Provisions and Quick Release Cargo Basket Installations must be in accordance with TCCA accepted, AERO Design Ltd. Instructions for Continued Airworthiness ICA751.90, Revision 2, dated 13 January 2015, or later TCCA accepted revision.


Certification Basis: FAR 29 at amendment 29-2, plus select sections of later amendments. (Bell 412 CF basis of certification).

— End —

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
75102	Quick Release Mounting Provisions Installation	1, 13/01/2015
ICA751.90	Instructions for Continued Airworthiness	2, 13/01/2015
FMS751.91	Flight Manual Supplement	2, 24/12/2014
FABRICATION DOCUMENTS		
DCL751-3	Document Control List for Mounting Beams Assembly	2, 13/01/2015

APPROVAL:

	Transport Canada	Transports Canada
AIRCRAFT CERTIFICATION DIVISION		
APPROVED		
By <u><i>[Signature]</i></u>		
Appr'l No. <u>SH07-056</u>		
Appr'l Date <u>2007-12-24</u>		
Issue No. <u>3</u>		
Issue Date <u>2015-02-06</u>		
<small>YY - MM - DD</small>		

ORIGINAL DATE:
13 January 2015
REVISION DATE:



Aero Design Ltd.

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Tel: 604.483.2376 www.aerodesign.ca

SHEET 1 OF 1

**Bell 205A-1/B, 212, 412/EP/CF
Quick Release Mounting Provisions
Installation (Configuration A)**



DCL751-4

Rev.

0

DOCUMENT CONTROL LIST


DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
75115	Forward Beam Assembly	1, 09/12/2014
75116	Aft Beam Assembly	1, 09/12/2014
75130	Forward Beam	1, 09/12/2014
75131	Aft Beam	1, 09/12/2014
75132	Tube Assembly	3, 09/12/2014
ENGINEERING DOCUMENTS		
ER751.01	Engineering Report	0, 18/07/2007
TR751.02	Test Plan and Report	0, 31/08/2007

APPROVAL:  Transport Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>[Signature]</u> App'l No. <u>SH07-56</u> App'l Date <u>2007-12-24</u> Issue No. <u>3</u> Issue Date <u>2015-02-06</u> <small>YY - MM - DD</small>	ORIGINAL DATE: 06 September 2007 REVISION DATE: 13 January 2015	 Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca
	SHEET 1 OF 1	Bell 205A-1/B, 212, 412/EP/CF Quick Release Mounting Beams Fabrication
	DCL751-3	Rev. 2

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
75101	Quick Release Cargo Basket Installation	2, 13/01/2015
75103	Quick Release Cargo Basket Installation - Alternate	0, 13/01/2015
ICA751.90	Instructions for Continued Airworthiness	2, 13/01/2015
FMS751.91	Flight Manual Supplement	2, 24/12/2014
FABRICATION DOCUMENTS		
DCL751-2	Document Control List for Cargo Basket Assembly	1, 13/05/2015

APPROVAL:

	Transport Canada	Transports Canada
AIRCRAFT CERTIFICATION DIVISION		
APPROVED		
By <u><i>[Signature]</i></u>		
Appr'l No. <u>5407256</u>		
Appr'l Date <u>2007-12-24</u>		
Issue No. <u>3</u>		
Issue Date <u>2015-02-06</u>		
YY - MM - DD		

ORIGINAL DATE:
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REVISION DATE:
13 January 2015



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SHEET 1 OF 1

**Bell 205A-1/B, 212, 412/EP/CF
Quick Release Cargo Basket
Installation (Configuration B)**

DCL751-1


Rev.

2

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
75110	Cargo Basket Assembly	1, 07/12/2014
75111	Basket Fabrication	1, 07/12/2014
75112	Standard Lid Fabrication	1, 06/12/2014
75121	Basket Components - End Hoop	2, 07/12/2014
75127	Basket Components - Placard	1, 13/01/2015
75129	Basket Components - Lugs	2, 07/12/2014
49210	Basket Components - Hoops	2, 22/05/2014
49215	Basket Components - Spacer	1, 13/03/2014
49216	Basket Components - Spacer	1, 13/03/2014
84240	Lid Brace Installation	0, 21/05/2014
84255	Handle Assembly	2, 13/03/2014
84261	Handle Bar Assembly	2, 13/03/2014
84262	Basket Handle Provisions Assembly	2, 14/02/2014
84263	Lid Handle Provisions Assembly	0, 14/02/2014
84265	Handle Lever	2, 13/03/2014
84267	Handle Bracket	1, 13/03/2014
84272	Bushing	1, 13/03/2014
36273	Lid Bracket	2, 18/02/2014
36274	Bushing	3, 13/03/2014
36275	Bushing	4, 04/10/2013
36277	Handle Bar	1, 13/03/2014
36278	Spring	4, 01/12/2014
36280	Lid Brace Assembly	3, 13/03/2014
ENGINEERING DOCUMENTS		
ER751.01	Engineering Report	0, 18/07/2007
TR751.02	Load Test Plan and Report	0, 31/08/2007
FTP751.03	Flight Test Plan	0, 06/09/2007
	Flight Test Report – Transport Canada	11/12/2007

APPROVAL:

 Transport Canada Transports Canada

AIRCRAFT CERTIFICATION DIVISION

APPROVED

By *[Signature]*

App'l No. 5H07056

App'l Date 2007-12-24

Issue No. 3

Issue Date 2015-02-06

YY - MM - DD

ORIGINAL DATE:
06 September 2007

REVISION DATE:
13 January 2015



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SHEET 1 OF 1

Bell 205A-1/B, 212, 412/EP/CF
Quick Release Cargo Basket
Fabrication

DCL751-2


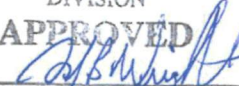
Rev.

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DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
80001	Quick Release Cabin Step Installation	1, 13/01/2015
80003	Quick Release Cabin Step Installation, Alternate	0, 13/01/2015
ICA800.90	Instructions for Continued Airworthiness	3, 13/01/2015
FMS751.91	Flight Manual Supplement	2, 24/12/2014
FABRICATION DOCUMENTS		
DCL800-11	Document Control List for Quick Release Step Assembly	1, 13/01/2015

APPROVAL:

	Transport Canada	Transports Canada
AIRCRAFT CERTIFICATION DIVISION		
APPROVED		
By 		
Appr'l No. <u>SH07-886</u>		
Appr'l Date <u>2007-12-24</u>		
Issue No. <u>3</u>		
Issue Date <u>2015-02-06</u>		
YY - MM - DD		

ORIGINAL DATE:
15 September 2008
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13 January 2015



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SHEET 1 OF 1

**Bell 205A-1/B, 212, 412/EP/CF
Quick Release Cabin Step
Installation (Configuration C)**


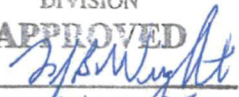

DCL800-1

Rev.

1

DOCUMENT CONTROL LIST


DOCUMENT NO.	DOCUMENT CONTENT	REVISION
80010 80020	FABRICATION DOCUMENTS	
	Step Assembly Step End Fabrication	2, 11/12/2014 1, 10/12/2014
ER800.01	ENGINEERING DOCUMENTS	
	Engineering Report	0, 18/07/2007

APPROVAL:  <div style="display: flex; justify-content: space-between; font-size: small;"> Transport Canada Transports Canada </div> <div style="text-align: center; font-weight: bold; margin-top: 5px;">AIRCRAFT CERTIFICATION DIVISION</div> <div style="text-align: center; font-weight: bold; margin-top: 5px;">APPROVED</div> <div style="margin-top: 5px;"> By:  Appr'l No. <u>5H07-56</u> Appr'l Date <u>2007-12-24</u> Issue No. <u>3</u> Issue Date <u>2015-02-06</u> <small>YY-MM-DD</small> </div>	<small>ORIGINAL DATE:</small> 15 September 2008 <small>REVISION DATE:</small> 13 January 2015	<div style="display: flex; align-items: center;">  <div> Aero Design Ltd. <small>9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca</small> </div> </div> <div style="text-align: center; margin-top: 10px;"> Bell 205A-1/B, 212, 412/EP/CF Quick Release Cabin Step Fabrication </div> <div style="display: flex; justify-content: space-between; align-items: center; margin-top: 10px;"> <div style="text-align: center; flex-grow: 1;"> DCL800-11 </div> <div style="text-align: center; flex-grow: 1;"> <small>Rev.</small> 1 </div> </div>
SHEET 1 OF 1		

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
95501	Quick Release Cargo Basket Installation	1, 13/01/2015
95502	Quick Release Cargo Basket Installation - Alternate	0, 13/01/2015
ICA751.90	Instructions for Continued Airworthiness	2, 13/01/2015
FMS751.91	Flight Manual Supplement	2, 24/12/2014
FABRICATION DOCUMENTS		
DCL955-2	Document Control List for Cargo Basket Assembly	2, 13/01/2015

APPROVAL:

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AIRCRAFT CERTIFICATION DIVISION		
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By <u><i>[Signature]</i></u>		
Appr'l No. <u>5407-56</u>		
Appr'l Date <u>2007-12-24</u>		
Issue No. <u>3</u>		
Issue Date <u>2015-02-06</u>		
YY-MM-DD		

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REVISION DATE:



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SHEET 1 OF 1

**Bell 205A-1, 205B, 212
Quick Release Cargo Basket
Installation (Configuration E)**

DCL955-3

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0

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
95510	Cargo Basket Assembly	1, 09/12/2014
95511	Basket Fabrication	1, 09/12/2014
95512	Standard Lid Fabrication	1, 09/12/2014
95523	Attachment Hoop	1, 09/12/2014
95524	Basket Components - End Hoop	1, 09/12/2014
95527	Basket Components - Placard	2, 13/01/2015
94520	Basket Components - Hoops	1, 10/04/2014
49215	Basket Components - Spacer	1, 13/03/2014
49216	Basket Components - Spacer	1, 13/03/2014
84240	Lid Brace Installation	0, 21/05/2014
84255	Handle Assembly	2, 13/03/2014
84261	Handle Bar Assembly	2, 13/03/2014
84262	Basket Handle Provisions Assembly	2, 14/02/2014
84263	Lid Handle Provisions Assembly	0, 14/02/2014
84265	Handle Lever	2, 13/03/2014
84267	Handle Bracket	1, 13/03/2014
84272	Bushing	1, 13/03/2014
36273	Lid Bracket	2, 18/02/2014
36274	Bushing	3, 13/03/2014
36275	Bushing	4, 04/10/2013
36277	Handle Bar	1, 13/03/2014
36278	Spring	4, 01/12/2014
36280	Lid Brace Assembly	3, 13/03/2014
ENGINEERING DOCUMENTS		
ER955.01	Engineering Report	0, 20/01/2012
ER751.01	Engineering Report	0, 18/07/2007
FTP955.03	Flight Test Plan	0, 27/01/2012

APPROVAL:

 Transport Canada Transports Canada
AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>[Signature]</u> App'l No. <u>5407-56</u> App'l Date <u>2007-12-24</u> Issue No. <u>3</u> Issue Date <u>2015-02-06</u> <small>YY - MM - DD</small>

ORIGINAL DATE:
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REVISION DATE:
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SHEET 1 OF 1

Bell 205A-1, 205B, 212
Quick Release Cargo Basket
Fabrication

DCL955-2

Rev.

2



DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
100605	Quick Release Mounting Provisions Installation – Low Mounted	0, 13/01/2015
100606	Quick Release Mounting Provisions Installation – High Mounted	0, 13/01/2015
ICA751.90	Instructions for Continued Airworthiness	2, 13/01/2015
FABRICATION DOCUMENTS		
DCL1006-12	Document Control List for Quick Release Mounting Provisions Assembly	0, 16/01/2015

APPROVAL: <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> Transport Canada <small>Transports Canada</small> </div> </div> <div style="text-align: center; margin-top: 5px;"> AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>[Signature]</u> Appr'l No. <u>SH07-56</u> Appr'l Date <u>2007-12-24</u> Issue No. <u>3</u> Issue Date <u>2015-02-06</u> <small>YY-MM-DD</small> </div>		ORIGINAL DATE: 16 January 2015 REVISION DATE:	 Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca
SHEET 1 OF 1		Bell 205A-1/B, 212, 412/EP/CF Quick Release Mounting Provisions Installation (Configuration E)	
DCL1006-2		Rev. 0	

DOCUMENT CONTROL LIST


DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
100630	Forward Beam Fabrication – Low Mounted	0, 18/12/2014
100631	Aft Beam Fabrication – Low Mounted	0, 18/12/2014
100632	Forward Beam Fabrication – High Mounted	0, 18/12/2014
100633	Aft Beam Fabrication – High Mounted	0, 18/12/2014
100635	Struts Fabrication	0, 18/12/2014
ENGINEERING DOCUMENTS		
ER1006.01	Engineering Report	0, 16/01/2015
TR1006.02	Test Plan and Report	0, 05/12/2014
FTP1006.03	Flight Test Plan and Report	0, 18/12/2014
	Flight Test Report – Transport Canada	14/11/2014

APPROVAL:  Transport Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <u>[Signature]</u> Appr'l No. <u>SH07-56</u> Appr'l Date <u>2007-12-24</u> Issue No. <u>3</u> Issue Date <u>2015-02-06</u> <small>YY - MM - DD</small>	ORIGINAL DATE: 16 January 2015 REVISION DATE:	 Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca
SHEET 1 OF 1	Bell 205A-1/B, 212, 412/EP/CF Quick Release Mounting Provisions Assembly	
DCL1006-12	Rev. 0	

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
100601	Quick Release Mega Cargo Basket Installation – Standard Lid Configuration	0, 13/01/2015
100602	Quick Release Mega Cargo Basket Installation – Extended Lid Configuration	0, 13/01/2015
100640	Option – Step Modification Installation	0, 13/01/2015
ICA751.90	Instructions for Continued Airworthiness	2, 13/01/2015
FMS751.91	Flight Manual Supplement	2, 24/12/2014
FABRICATION DOCUMENTS		
DCL1006-11	Document Control List for Quick Release Cargo Basket Assembly	0, 16/01/2015

APPROVAL:

	Transport Canada	Transports Canada
AIRCRAFT CERTIFICATION DIVISION		
APPROVED		
By <u><i>[Signature]</i></u>		
Appr'l No. <u>5107656</u>		
Appr'l Date <u>2007-12-24</u>		
Issue No. <u>3</u>		
Issue Date <u>2015-02-06</u>		
YY-MM-DD		

ORIGINAL DATE:
16 January 2015
REVISION DATE:



Aero Design Ltd.

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Powell River, BC, Canada, V8A 0G3
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SHEET 1 OF 1

**Bell 205A-1, 205B, 212
Quick Release Mega Cargo Basket
Installation (Configuration F)**

DCL1006-1

Rev.

0

DOCUMENT CONTROL LIST


DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
100610	Cargo Basket Assembly	0, 26/11/2014
100611	Basket Fabrication	0, 26/11/2014
100612	Standard Lid Fabrication	0, 22/12/2014
100613	Extended Lid Fabrication	0, 26/11/2014
100616	Filler Sheet Fabrication	0, 26/11/2014
100620	Standard Hoop Fabrication	0, 26/11/2014
100621	End Hoop Fabrication	0, 26/11/2014
100622	Attachment Hoop Fabrication	0, 26/11/2014
100623	Standard Lid Hoop Fabrication	0, 26/11/2014
100624	Standard Lid End Hoop Fabrication	0, 26/11/2014
100625	Extended Lid Hoop Fabrication	0, 27/11/2014
100626	Extended Lid End Hoop Fabrication	0, 27/11/2014
100627	Placard	0, 13/01/2015
100650	Step Assembly	0, 26/11/2014
49215	Spacer	1, 13/03/2014
49216	Spacer	1, 13/03/2014
84240	Lid Brace Installation	0, 21/05/2014
84255	Handle Assembly	2, 13/03/2014
84261	Handle Bar Assembly	2, 13/03/2014
84262	Basket Handle Provisions Assembly	2, 14/02/2014
84263	Lid Handle Provisions Assembly	0, 14/02/2014
84265	Handle Lever	2, 13/03/2014
84267	Handle Bracket	1, 13/03/2014
84272	Bushing	1, 13/03/2014
36273	Lid Bracket	2, 18/02/2014
36274	Bushing	3, 13/03/2014
36275	Bushing	4, 04/10/2013
36277	Handle Bar	1, 13/03/2014
36278	Spring	4, 01/12/2014
36280	Lid Brace Assembly	3, 13/03/2014
ENGINEERING DOCUMENTS		
ER1006.01	Engineering Report	0, 16/01/2015
TR1006.02	Load Test Plan and Report	0, 05/12/2014
FTP1006.03	Flight Test Plan	0, 18/12/2014
	Flight Test Report – Transport Canada	14/11/2014

APPROVAL: <div style="display: inline-block; text-align: center;"> Transport Canada </div> <div style="display: inline-block; text-align: center;"> Transports Canada </div> AIRCRAFT CERTIFICATION DIVISION <div style="text-align: center; font-weight: bold; font-size: 1.2em;">APPROVED</div> <div style="text-align: center; font-family: cursive; font-size: 1.5em; color: blue;"> <i>[Signature]</i> </div> By _____ Appr'l No. <u>SHOT-56</u> Appr'l Date <u>2007-12-24</u> Issue No. <u>3</u> Issue Date <u>2015-02-06</u> <small>YY-MM-DD</small>	ORIGINAL DATE: 16 January 2015 REVISION DATE:	<div style="text-align: center;"> Aero Design Ltd. <small>9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca</small> </div>	
	SHEET 1 OF 1	Bell 205A-1, 205B, 212 Quick Release Mega Cargo Basket Fabrication	
	<div style="font-size: 2.5em; font-weight: bold;">DCL1006-11</div>		Rev. <div style="font-size: 2.5em; font-weight: bold;">0</div>

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
70408	INSTALLATION DOCUMENTS Installation, Hangar Wheel	1, 29/05/2014
70401	FABRICATION DOCUMENTS Open Forward End Modification (Bell 206L/407 Fixed and McDonnell Douglas MD600N Quick Release Only)	1, 04/12/2008
70402	Lid Door Modification	2, 29/05/2014
70403	Auxiliary Latch Modification	5, 29/05/2014
70404	Open Forward End Modification (Bell 206L/407 Quick Release Only)	2, 27/10/2011
70405	Lid Step Modification	4, 29/05/2014
70406	Open Forward End Modification (Eurocopter AS350/AS355 and Bell 206B Quick Release Only)	3, 14/07/2014
70407	Open Forward End Modification (Eurocopter EC135 Quick Release and Bell 205/212/412 Quick Release Only)	1, 16/12/2014
70411	Open Forward End Modification (Bell 206L/407 Large Quick Release Only)	0, 27/10/2011
70428	Assembly, Hangar Wheel	1, 29/05/2014
70438	Parts, Hangar Wheel	1, 29/05/2014
ER704.02	ENGINEERING DOCUMENTS Engineering Report	0, 24/02/2006

APPROVAL:

	Transport Canada	Transports Canada
AIRCRAFT CERTIFICATION DIVISION		
APPROVED		
By <u><i>[Signature]</i></u>		
Appr'l No. <u>5H07G56</u>		
Appr'l Date <u>2007-12-24</u>		
Issue No. <u>3</u>		
Issue Date <u>2015-02-06</u>		
YY - MM - DD		

ORIGINAL DATE:

10 May 2006

REVISION DATE:

18 December 2014



Aero Design Ltd.

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SHEET 1 OF 1

**Cargo Basket
Modifications**

DCL704

Rev.

10

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-4 TRANSPORT CATEGORY ROTORCRAFT – CAR 529

BLOCK 1

Name of the applicant for the design change approval:	Aero Design Ltd.
Description of the design change:	Installation of Quick Release Cabin Step on Bell 205/212/214/412
Certification Basis of design change and revision date:	FAR 29, Amendment 29-2
CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed:	Section 0-3 of Supplemental ICA (ICA 800.90, Rev. 3)
CAR Standard 513.05 (1) (g) (iv): Installation Instructions:	Installation Drawing 80001, 80003

BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.	ICA ref: Bell 205/212/214/412 Maintenance Manuals BHT-205A1-MM-1 BHT-212-MM BHT-214B-MM-1 BHT-412-MM	Supplemental ICA ref: Single Manual (ICA800.90, Rev. 3)
A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement.	ICA ref: Bell 205/212/214/412 Maintenance Manual	Supplemental ICA ref: Arranged in ATA format
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (a) Rotorcraft maintenance manual or section		
A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance.	ICA ref: Bell 205/212/214/412 Maintenance Manual Chapter 1	Supplemental ICA ref: Section 0-1

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances.	ICA ref: Bell 205/212/214/412 Maintenance Manual Chapter 1	Supplemental ICA ref: Section 0-5
A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 12	Supplemental ICA ref: N/A
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (b) Maintenance Instructions.		
A527.3 (b) (1) Scheduling The Instructions for Continued Airworthiness must contain the following information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 25	Supplemental ICA ref: Section 25-1 thru 25-2
A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 7 and 8	Supplemental ICA ref: Section 25-3
A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3	Supplemental ICA ref: Section 5-3
A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2	Supplemental ICA ref: Section 25-4
A527.3 (g) Special tools (g) A list of special tools needed.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3

Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

A529.4 AWL - Separate Section 1 The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under 525.571. If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 4	Supplemental ICA ref: Chapter 4
---	--	---------------------------------

BLOCK 4 – Applicant Statement of Compliance

The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.	
Applicants Signature: <u>Jeff Clarke</u>	Date: <u>19 December 2014</u>
Applicants Name: <u>Jeff Clarke, Vice President</u>	

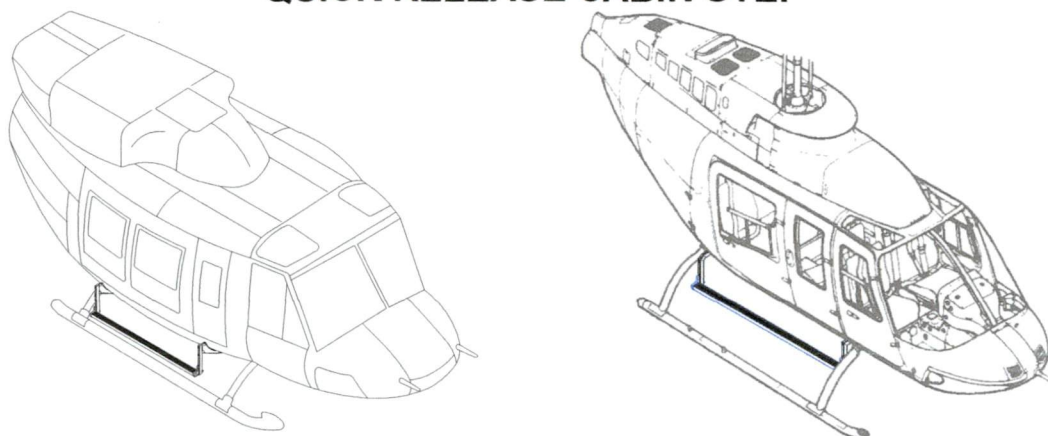
BLOCK 5 – Minister's Statement of Acceptability

The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.			
Reviewer's Name: _____	Phone # _____	Email: _____	Mail Routing Symbol: _____
Signature: _____	Date: _____	NAPA Number: _____	

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 800.90

BELL 205, 212, 214, 412 SERIES BELL 206L SERIES, 407

QUICK RELEASE CABIN STEP



TCCA Supplemental Type Certificate No. SH00-48, SH07-56
FAA Supplemental Type Certificate No. SR02253NY, SR02730NY
EASA Supplemental Type Certificate No. _____

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when the Quick Release Step installed in accordance with Aero Design Ltd. Document Control List DCL800-1, Revision 1, or later approved revision, or Document Control List DCL800-2, Revision 0, or later approved revision, is installed.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 3
Date: 13 December 2014

Aero Design Ltd.



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RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0	17 July 2008		Original Issue
1	18 November 2008		
2	2 December 2008		
3	13 December 2014		

LIST OF EFFECTIVE PAGES

List of Revisions	Revision 0 (Original Issue)	17 July, 2008
	Revision 1	18 November, 2008
	Revision 2	2 December, 2008
	Revision 3	13 December 2014

List of Effective Pages

<u>Description</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	3
Revision Record/List of Effective Pages	2	3
Table of Contents	3	3
00-00-00	4	3
	5	3
04-00-00	6	3
05-00-00	7	2
	8	3
	9	3
25-50-00	10	3
	11	3
	12	3
	13	3
	14	3

NOTE

Revised text is indicated by a black vertical line. A revised page with only a vertical line next to the page number indicates that text has shifted or that non-technical correction(s) were made on that page. Insert latest revision pages; dispose of superseded pages.

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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 27/29.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Quick Release Step as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness

LH - Left Hand

RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Quick Release Step. Requests for a copy may be made in writing to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

0-5 GENERAL DESCRIPTION

The Quick Release Step installation consists of a step assembly which is attached to quick release mounting provisions installed on the helicopter. These mounting provisions are capable of mounting various equipment including cargo baskets.

The step itself consists of an aluminum extrusion welded to brackets on the ends with fittings that lock into the quick release mechanism on the mounting beams.

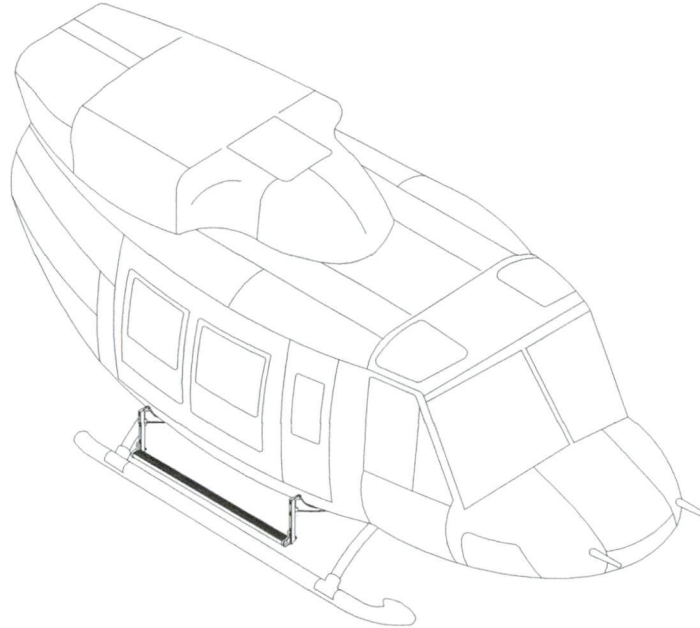


Figure 0.1 – Bell Medium Step Installation

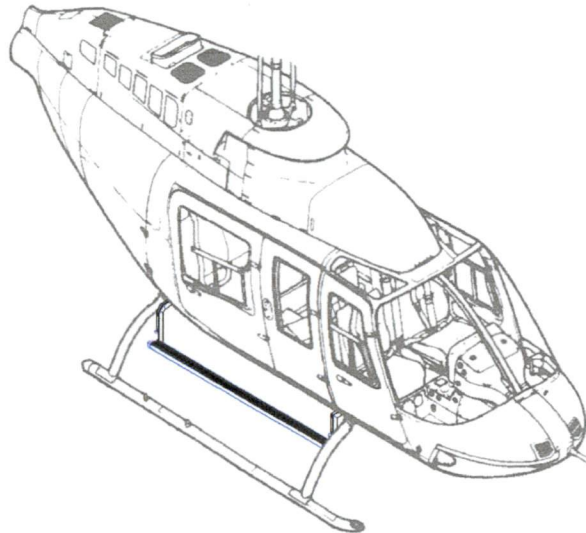


Figure 0.2 – Bell 206L / 407 Step Installation

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

FAR 29

The Airworthiness Limitations section is FAA approved and specifies maintenance required under Sections 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

FAR 27

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

EASA

The Airworthiness Limitations section is approved and variations must also be approved.

No additional airworthiness limitations have been imposed due to installation of the Quick Release Step.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of Quick Release Step.

Daily Inspection

1. Inspection Area: Step

- a) Inspect the step attachment to the beams for condition and security. Ensure quick release mechanism is completely extended, flush with the outboard surface of the beam.

300 Hour or Annual Inspection

Refer to the ICA for the Quick Release Cargo Basket for each specific model of helicopter for inspection of mounting provisions.

1. Inspection Area: Step

- a) Visually inspect welds attaching end brackets to step extrusion for cracks, corrosion or other damage.
- b) Visually inspect step for damage.
- c) Visually inspect lugs attaching the step to the beams for security and damage.

Special Inspections

Following a hard landing inspect the Quick Release Step installation in accordance with the 300 hour or annual inspection listed above.

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

Refer to the ICA for the Quick Release Cargo Basket for each specific model of helicopter for further limits and repair instructions.

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Step Assembly

Part	Type of Damage	Max. Allowable	Repair
Step End Bracket	Corrosion	0.010" deep	Blend up to 0.010" deep with scotchbrite.
	Scratches / Nicks	0.010" deep x 0.5" long	Blend up to 0.010" deep with scotchbrite.
	Cracks/Dents	None	N/A
	Bent Lugs	None	N/A
Centre Step Section	Corrosion	2" x 2" x 0.010" deep	Blend up to 0.010" deep with scotchbrite.
	Scratches / Nicks	0.010" deep x 1" long	Blend up to 0.010" deep with scotchbrite.
	Cracks / Dents	None	N/A
	Permanent Deflection of Step	0.25" max at middle of step	None

2. Steel Beams

Part	Type of Damage	Max. Allowable	Repair
Steel Beam	Corrosion	0.030" deep	Blend up to 0.030" deep with scotchbrite.
	Scratches / Nicks (Outboard face)	0.030" deep x 0.125" wide	Blend up to 0.030" deep with scotchbrite.
	Scratches / Nicks (all other sides)	0.060" deep x 0.125" wide	Blend up to 0.060" deep with scotchbrite.
	Cracks/Dents	None	N/A
	Elongation of Keyway	See figure 3	None
	Widening of slots	27/64" (0.422) diameter (check with a 27/64" drill)	None



Figure 5.1 – Critical Keyway dimensions
(Bell Medium beam shown, Bell 206L/407 critical keyway same)

3. Step Welds

Cracks up to 0.25" long may be repaired as follows:

- a) Clean area of paint.
- b) Grind away weld in area of crack.
- c) T.I.G. weld per MIL-STD-2219 Class "C" using ER4043 filler rod. Do not grind flush.
- d) Touch up paint as noted in section 5-3.

5-3 PROTECTIVE TREATMENT INFORMATION

1. Step Assembly

The Step Assembly is supplied powder coated or painted. If the finish is damaged, touch up with polyurethane paint. The tread area is painted with anti-skid paint. If the anti-skid paint is damaged, touch up with Randolph X1567 Wingwalk grip paint or equivalent.

CHAPTER 25 – EQUIPMENT AND FURNISHINGS

The Quick Release Step Installation may be applied to the right and/or left side of the helicopter. A stowed position located on the inboard side of the mounting provisions is provided on some configurations. Refer to the ICA for the Quick Release Cargo Basket for each specific model of helicopter for installation and removal instructions for the mounting provisions.

25-1 STEP REMOVAL

75102 / 70102 / 70202 Mounting Provisions

Refer to Figure 25.1.

1. Pull knob at bottom end of forward beam and lift step until lower attachment fitting is free of keyway. Keep upper attachment in keyway on beam.
2. Pull knob at bottom end of aft beam and lift step until lower attachment fitting is free of keyway. Keep upper attachment in keyway on beam.
3. Lift step until upper attachments are out of keyways on both beams and remove from helicopter.

100605/100606 Mounting Provisions

Refer to Figure 25.2.

1. Pull knob at bottom end of aft beam and lift aft end of step until attachment fittings are free of keyways.
2. Slide step forward until forward attachment fittings are free of keyways and remove from helicopter.

25-2 STEP INSTALLATION

75102 / 70102 / 70202 Mounting Provisions

Refer to Figure 25.1.

1. Set upper attachment into upper keyway in forward and aft beams.
2. Lift step until lower attachment fitting hits stop. Push fitting into keyway and slide step down until locked.

100605/100606 Mounting Provisions

Refer to Figure 25.2.

1. At forward mounting beam, slide step attachment fittings into keyways on mounting beam.
2. At aft mounting beam, slide step aft and lift step until attachment fitting hits stop over keyway. Push fittings into keyways and slide step down until locked.

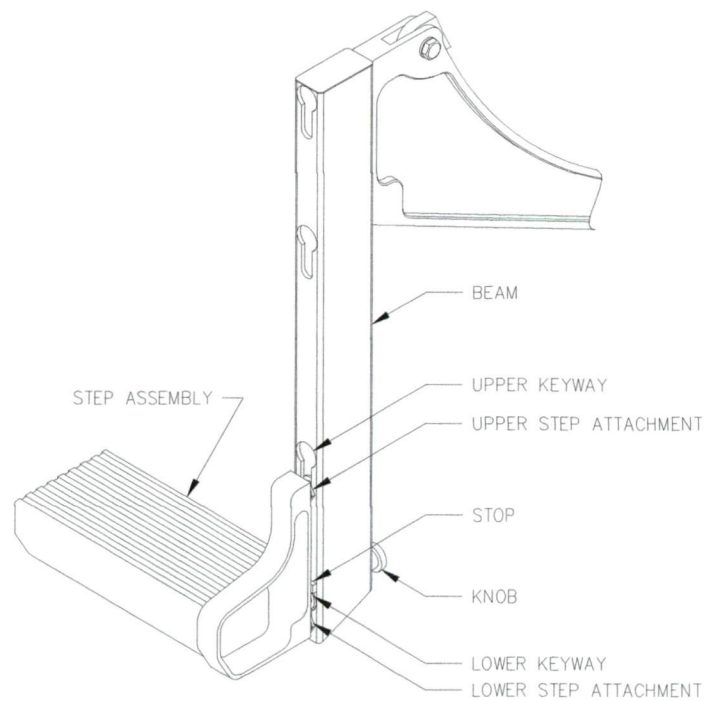


Figure 25.1 – Step Attachment
 (75102 Bell Medium Attachment shown, 70102 / 70202 Bell 206L/407 Attachments same)

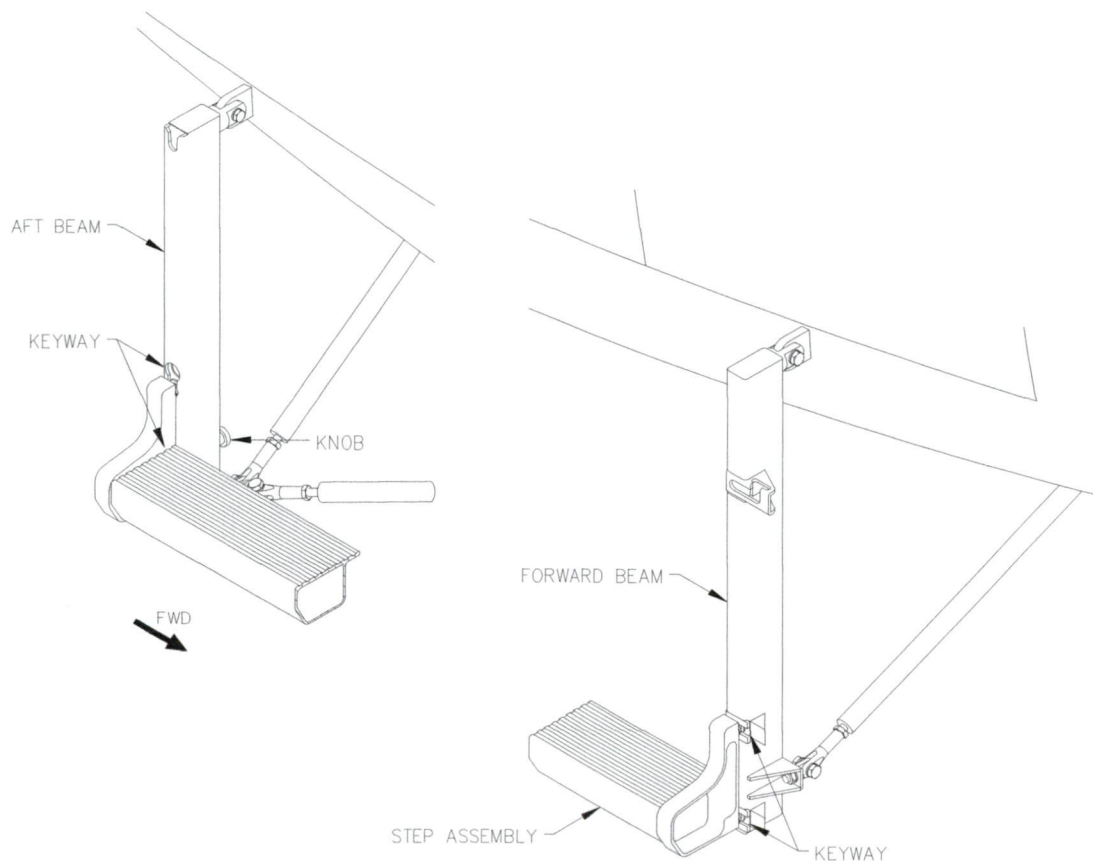


Figure 25.2 – Step Attachment
 (100605 Bell Medium Attachment Shown, 100606 Attachment same)

25-3 WEIGHT AND BALANCE

Different weight and balance configurations are required as the step may be removed/installed in the field. The first is the installation of Provisions only, see ICA for mounting provisions for weight and balance information. The second is the Step installed in the standard position. The third is Step installed in the stowed position if available.

Bell 205 / 212 / 214 / 412 Series

75102 Mounting Provisions

Standard Units						
Part #	Name	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
Step in Standard Position						
75102-01	Provisions Installation	9.6	118.3	1136.0	46.6	447.6
80010-7100	Step	7.8	119.8	934.4	52.2	407.1
80001-01	Step Installation (Total)	17.4	119.0	2070.4	49.1	854.7
Step in Stowed Position						
75102-01	Provisions Installation	9.6	118.3	1136.0	46.6	447.6
80010-7100	Step	7.8	119.8	934.4	46.6	363.5
80001-01	Step Installation (Total)	17.4	119.0	2070.4	46.6	811.1

Metric Units						
Part #	Name	Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
Step in Standard Position						
75102-01	Provisions Installation	4.4	3005	13071	1184	5149
80010-7100	Step	3.5	3043	10772	1326	4694
80001-01	Step Installation (Total)	7.9	3022	23843	1247	9842
Step in Stowed Position						
75102-01	Provisions Installation	4.4	3005	13071	1184	5149
80010-7100	Step	3.5	3043	10772	1184	4179
80001-01	Step Installation (Total)	7.9	3022	23843	1184	9328

Note: Lateral arms are given for right side installation. For installation on left side, lateral arms are negative.

100605 Low Mounting Provisions

Standard Units						
Part #	Name	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
Step in Standard Position						
100605-01-XX	Provisions Installation	11.2	120.6	1351.2	45.8	513.4
80010-7100	Step	7.8	120.7	941.5	51.0	397.8
80003-01-XX	Step Installation (Total)	19.0	120.7	2292.6	48.0	911.2

Metric Units						
Part #	Name	Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
Step in Standard Position						
100605-01-XX	Provisions Installation	5.1	3064	15567	1164	5915
80010-7100	Step	3.5	3066	10847	1295	4583
80003-01-XX	Step Installation (Total)	8.6	3065	26414	1218	10498

Note: Lateral arms are given for right side installation (XX = 02). For installation on left side (XX = 01), lateral arms are negative.

100606 High Mounting Provisions

Standard Units						
Part #	Name	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
Step in Standard Position						
100606-01-XX	Provisions Installation	11.6	124.0	1438.6	45.9	532.2
80010-7100	Step	7.8	120.4	939.1	51.0	397.8
80003-02-XX	Step Installation (Total)	19.4	122.6	2377.8	47.9	930.0

Metric Units						
		Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
Part #	Name					
Step in Standard Position						
100606-01-XX	Provisions Installation	5.3	3150	16575	1165	6131
80010-7100	Step	3.5	3058	10820	1295	4583
80003-02-XX	Step Installation (Total)	8.8	3113	27395	1218	10715

Note: Lateral arms are given for right side installation (XX = 02). For installation on left side (XX = 01), lateral arms are negative.

Bell 206L Series / 407

Standard Units						
Part #	Name	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
Step in Standard Position						
70102-01	Provisions Installation (407)					
70202-01	Provisions Installation (206L)	19.9	113.3	2255.3	11.7	233.6
80010-7475	Step	8.2	114.1	935.6	29.3	239.9
80002-01	Step Installation (Total)	28.1	113.6	3190.9	16.9	473.5
Step in Stowed Position						
70102-01	Provisions Installation (407)					
70202-01	Provisions Installation (206L)	19.9	113.3	2255.3	11.7	233.6
80010-7475	Step	8.2	114.1	935.6	23.7	194.3
80002-01	Step Installation (Total)	28.1	113.6	3190.9	15.2	427.9

Metric Units						
Part #	Name	Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
Step in Standard Position						
70102-01	Provisions Installation (407)					
70202-01	Provisions Installation (206L)	9.0	2878	25987	297	2684
80010-7475	Step	3.7	2898	10781	744	2768
80002-01	Step Installation (Total)	12.7	2885	36768	429	5452
Step in Stowed Position						
70102-01	Provisions Installation (407)					
70202-01	Provisions Installation (206L)	9.0	2878	25987	297	2684
80010-7475	Step	3.7	2898	10781	602	2239
80002-01	Step Installation (Total)	12.7	2885	36768	386	4923

25-4 STRUCTURAL FASTENER DATA

Refer to Standard Practices Manual for torque values not listed in this ICA.



SIGNED UNDERTAKING

In accordance with CAR 521 _____ Aero Design Ltd. _____ hereby

Company to hold the approval document(s):

undertake to carry out the responsibilities of a design approval document holder, as set out in Division VIII of Part V, Subpart 21 of the CARs, regarding:

1. Technical capability,
2. Service difficulty reporting,
3. Establishing a service difficult reporting system,
4. Investigation of service difficulty reports,
5. Mandatory changes,
6. Transfers,
7. Record keeping and loss or disposal of records,
8. Manuals,
9. Instructions for continued airworthiness, and
10. Supplemental integrity instructions

The responsibilities noted above are with reference to the data which may be found with one or more of the following numbers:

Transport Canada file number: _____ C-14-0978 _____


and / or

Project Reference number: _____ 751, 800, 955, 1006 _____

and / or

Approval Number: _____ SH07-56, Issue 3 _____

X


Signature of Holder's authorized person: _____

21 January 2015

Date: _____

Vice President

Position / Title: _____



DECLARATION OF CONFORMITY WITH THE CERTIFICATION BASIS

In accordance with Canadian Aviation Regulations Subpart 521, I hereby declare that the design of the Quick Release Mounting Provisions, Cargo Basket Installation, and Step Installation, as detailed in the data approved by Transport Canada on approval SH07-56, Issue 3, has been demonstrated to conform to the best of my knowledge to the basis of certification established by the Minister for that approval in file C-14-0978.

Aero Design Ltd.

per: _____

Signature

Jeff Clarke

Print Name

Vice President

Title

21 January 2015

Date

Transport
CanadaTransport
Canada

MINISTERIAL DELEGATE STATEMENT OF COMPLIANCE WITH THE CERTIFICATION BASIS

1. Reference No. NAPA File; C-14-0978 Aero Design Project #; 1006 Wings Engineering Project No.; WPN1412		2. Applicant Name Aero Design Ltd. 9888A Malaspina Road, Powell River, BC, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca	
Part 1: Identification of Aeronautical Product			
3. Applicable Design Approval Document No. 212, 412, 412EP, 412CF: TCCA TCDS No.: H-86 Issue 12, 205B: TCCA TCDS No.; H-104 Issue 5, 205A-1: FAA TCDS No.: H4SW Revision 29 FAA TCDS No.; H1SW Revision 24 FAA TCDS No.; H1SW Revision 24			
4. Model No. 205A-1, 205B, 212, 412, 412EP, 412CF		5. Make Bell Helicopter Textron Inc. PO Box 482, Fort Worth, Texas 76101 USA	
6. Type (aircraft, engine, propeller, appliance, part) Helicopter			
Part 2: Substantiating Reports and Data			
7. Number See continuation sheets.		8. Title See continuation sheets.	
9. Purpose of Finding of Compliance Revise STC SH07-56 to Issue 3 iaw TCCA accepted Certification Plan CP1006 Revision 1, 16 Jan 2015: <ul style="list-style-type: none">• 205B added to approval based on commonality with the 205A-1 and 212 airframes.• Larger basket configurations are added/approved for the 205/212 models only; (TCCA has noted that additional flight testing is required prior approval for the 412 models);<ul style="list-style-type: none">○ 955 Config, Large Baskets previously approved per LSTCs C-LSH12-30/D and C-LSH12-101/D.○ 1006 Config, Extra Large (Mega) Baskets new per issue 3 to STC.• The new 1006 mounts can also be used with the earlier 751 and 955 baskets per drawings 75103 and 95502 respectively.• Major changes to drawings, DCLs, FMS and ICA;<ul style="list-style-type: none">○ See specific documents CP1006, Section 7, Effect of Changes on Existing Findings of Compliance.○ See CP1006, Appendix B, Changed Documents for the listing of updates wrt Section 7.			
10. Applicable Elements of Certification Basis See Certification Plan CP1006, Revision 1 Appendix A, Compliance Program Checklist: <ul style="list-style-type: none">• DAR 304 has addressed the FoC requirements wrt the new 1006 Configurations as noted.• 1006 certification test flights completed by TCCA Flight Test Engineering on 14 Nov 2014;<ul style="list-style-type: none">○ 400 lb max payload test completed by Aero Design on 18 Dec 2014.• TCCA has approved and accepted documents as noted in CP1006 Revision 1;<ul style="list-style-type: none">○ Basket and Step FMS751.91 Revision 2 is approved by TCCA.○ Basket ICA751.90 Rev. 2 and Step ICA800.90 Rev. 3 are accepted by TCCA.			
Part 3: Ministerial Delegate Finding of Compliance with the Certification Basis			
Under the authority vested in me by the Minister under subsection 4.3(1) of the Aeronautics Act, I hereby find that the type design of the aeronautical product is in compliance with the certification basis as demonstrated by the applicant's substantiating reports and data to the best of my knowledge.			
11. Signature of Delegate	12. Name	13. Delegate No.	14. Date (yyyy-mm-dd)
	James Tinson	304	2015-01-20

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MINISTERIAL DELEGATE STATEMENT OF COMPLIANCE WITH THE CERTIFICATION BASIS

7. Number (Cont'd from Sht 1)	Rev, Date	8. Title (Continued from Sheet 1)
DCL1006-1	0, 16 Jan 2015	Document Control List – Cargo Basket Installation, <u>Configuration - F</u>
100601	0, 13 Jan 2015	Quick Release Mega Cargo Basket Installation – Std Lid Config
100602	0, 13 Jan 2015	Quick Release Mega Cargo Basket Installation – Extended Lid Config
100640	0, 13 Jan 2015	Option – Step Modification Installation
DCL1006-2	0, 16 Jan 2015	Document Control List – Quick Release Mnt'g Provisions Install, <u>Config - E</u>
100605	0, 13 Jan 2015	Quick Release Mounting Provisions Installation – Low Mounted
100606	0, 13 Jan 2015	Quick Release Mounting Provisions Installation – High Mounted
DCL1006-11	0, 16 Jan 2015	Document Control List – Cargo Basket Fabrication
100610	0, 26 Nov 2014	Cargo Basket Assembly
100611	0, 26 Nov 2014	Basket Fabrication
100612	0, 22 Dec 2014	Standard Lid Fabrication
100613	0, 26 Nov 2014	Extended Lid Fabrication
100616	0, 26 Nov 2014	Filler Sheet Fabrication
100620	0, 26 Nov 2014	Standard Hoop Fabrication
100621	0, 26 Nov 2014	End Hoop Fabrication
100622	0, 26 Nov 2014	Attachment Hoop Fabrication
100623	0, 26 Nov 2014	Standard Lid Hoop Fabrication
100624	0, 26 Nov 2014	Standard Lid End Hoop Fabrication
100625	0, 27 Nov 2014	Extended Lid Hoop Fabrication
100626	0, 27 Nov 2014	Extended Lid End Hoop Fabrication
100627	0, 13 Jan 2015	Placard
100650	0, 26 Nov 2014	Step Assembly
49215	1, 13 Mar 2014	Basket Components - Spacer
49216	1, 13 Mar 2014	Basket Components - Spacer
84240	0, 21 May 2014	Lid Brace Installation
84255	2, 13 Mar 2014	Handle Assembly
84261	2, 13 Mar 2014	Handle Bar Assembly
84262	2, 14 Feb 2014	Basket Handle Provisions Assembly
84263	0, 14 Feb 2014	Lid Handle Provisions Assembly
84265	2, 13 Mar 2014	Handle Lever
84267	1, 13 Mar 2014	Handle Bracket
84272	1, 13 Mar 2014	Bushing
36273	2, 19 Feb 2014	Lid Bracket

JAN 20 2015

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MINISTERIAL DELEGATE STATEMENT OF COMPLIANCE WITH THE CERTIFICATION BASIS

[illegible]

JAN 20 2015

Canada



INSTRUCTIONS FOR COMPLETION OF THE FORM MINISTERIAL DELEGATE FINDING OF COMPLIANCE WITH THE CERTIFICATION BASIS

- Block 1 - Enter a number unique to the originator or applicant for the type design approval to which the finding of compliance pertains. In the case where a new or amended design approval document will be issued, the number should be either the NAPA project number. In the case where a NAPA project number is not generated the reference number should be one generated and controlled by the applicant.
- Block 2 - Enter the name of the applicant who applied for the type design approval.
- Block 3 - In the case of findings of compliance for the initial type design approval of an aeronautical product this block would be left blank or as an example, add the Certification Plan report number. Otherwise enter the number of the applicable design approval document type affected. Typically this will refer to the type certificate or Canadian Technical Standard Order (CAN-TSO) design approval against which the requested type design approval would apply. "Model series XX" is not acceptable.
- Block 4 - Enter each model as listed on the type certificate data sheet for the affected aeronautical product. In the case of a new aeronautical product, print or type the model to be listed on the TCDS for the aeronautical product.
- Block 5 - Enter either the model series or the specific model number, as appropriate and as listed on the type certificate data sheet for the aeronautical product. If the requested type design approval is applicable to multiple models, list them separately. If the type design approval is for an appliance, part or component, separate from a type certification project, enter the model number of the appliance, part or component.
- Block 6 - Enter the type of aeronautical product as listed on the product's data sheet, or describe the appliance, part or component.
- Block 7 - Enter the number and revision level of the reports, drawings, analysis and documents.
- Block 8 - Enter the titles of all the applicable reports, drawings, analysis, or documents in this block. If there is not enough space additional pages may be attached. The delegate or authorized person must reference all reports and data that is generated in support of the requested type design approval: drawing numbers with change letters, report numbers with revision levels dates, and so forth. If the particular finding of compliance form does not cover all applicable elements, enter an explanatory statement, for example: "This finding of compliance is for the above engineering design data only." It indicates the data listed above demonstrates conformity of the type design of the aeronautical product only with those requirements specified by paragraph and subparagraph listed below as "applicable elements of the certification basis".
- Block 9 - Enter the type of project (ie, type certificate, Canadian Technical Standard Order (CAN-TSO) design approval, supplemental type certificate, etc) and the number of the design approval document that is to be issued, if known. Provide a brief description of the purpose for the requested type design approval and to what the specific findings of compliance apply. If this finding of compliance pertains to a revision of a manual, such as the aircraft flight manual, which will not require reissue of the corresponding design approval document as specified in block 3, then block 9 should have a statement that the design approval document specified in block 3 does not require reissue. This finding of compliance is for records purpose only.
- Block 10 - Enter the applicable elements of the certification basis at the section, subsection, paragraph, or other level as appropriate. This list is to include the applicable amendment levels. If the list is too long, attach additional sheets or refer to appropriate compliance documentation such as a Certification Plan if applicable. It is not sufficient for the delegate, or authorized person within an organizational delegate, to merely indicate "structural regulations" or to use other generalizations.
- Block 11 - The delegate, or authorized person within an organizational delegate, signs in this block.
- Block 12 - Enter the name of the delegate, or authorized person within an organizational delegate, in this block.
- Block 13 - Enter the delegation number of the delegate, or authorized person within an organizational delegate, in this block. In the case of an authorized person, enter the authorized person's number followed by the number of the organizational delegate.
- Block 14 - Enter the date the delegate, or authorized person within an organizational delegate, signs the form after making the finding(s) that the listed substantiating reports and data demonstrated that the type design of the aeronautical product conformed to the applicable certification basis.
- General - Each Design Approval Organization or Approved Engineering Organization can choose to create their own Finding of Compliance form provided it satisfies the intent as shown on the current form.**

APPLICANT: Aero Design Ltd.
9888 A Malaspina Road
Powell River, BC, Canada
V8A 0G3

DATE: 14 September 14
REVISION No. 1, 16 January 2015

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell
MODEL: 205A-1, 205B, 212, 412, 412EP, 412CF

REGISTRATION: All Eligible
SERIAL No.: All Eligible

NATURE OF WORK: Quick Release Mounting Provisions Installation; Quick Release Cargo Basket Installation
TYPE CERTIFICATE DATA SHEET: H-86, H1SW, H-104, H-80
MODEL CERTIFICATION BASIS: FAR 29 dated 1 February 1965, including amdt. 29-1, 29-2, and sections up to amdt. 29-32 (Bell 412CF, highest of all models)
MODIFICATION CERTIFICATION BASIS: FAR 29 dated 1 February 1965, including amdt. 29-1, 29-2, and sections up to amdt. 29-32 (Bell 412CF basis)

Airworthiness Requirement	FAR 29 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Subpart B - Flight						
29.29	2	Empty Weight and Corresponding C of G	Data specified on inst'n drawing			
29.45	2	Performance - General	Flight Test	X		
29.51	2	Takeoff data: General	Flight Test	X		
29.63	2	Takeoff: Category B	Flight Test	X		
29.65	2	Category B Climb: All Engines Operating	Flight Test	X		
29.71	2	Helicopter Angle of Glide: Category B	Flight Test	X		
29.73(b)	2	Performance at Min. Operating Speed	Flight Test	X		
29.75	2	Landing	Flight Test	X		
29.141	2	Flight Characteristics - General	Flight Test	X		
29.143	2	Controllability and Maneuverability	Flight Test	X		
29.171	2	Stability - General	Flight Test	X		
29.173	2	Static Longitudinal Stability	Flight Test	X		
29.175	2	Demonstration of Longitudinal Stability	Flight Test	X		
29.241	2	Ground Resonance	Flight Test	X		
29.251	2	Vibration	Flight Test	X		

304

X *James Tinson*
DAR No 304
JAN 20 2015

Flight test performed by TCCA test pilot M. Brulotte on 14 November 2014; TCCA CIR for flight test and first article signed on 23 December 2014

Additional flight test to expand cargo capacity performed by Aero Design on 18 December 2014 following additional successful load testing; company CIR signed on 18 December 2014; results accepted by M. Brulotte on 22 December 2014.

Flight testing for 412 model in accordance with FTP1006.03 is pending.

Airworthiness Requirement	FAR 29 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Subpart C – Strength Requirements						
29.301	2	Loads – Air Drag Loads	Analysis	X		Loads accepted 12 November 2014
29.301	2	Loads – Inertia Loads	Compliance with 29.337 and 29.561		X	
29.303	2	Factor of Safety	Analysis		X	
29.305	2	Strength and Deformation			X	
29.307	2	Proof of Structure	Analysis and Test iaw Test Plan TR1006.02		X	
29.337(a)	2	Limit Maneuvering Load Factor – Positive			X	Critical load factor in downward direction.
29.547	2	Main Rotor Structure	Flight Test	X		
29.561(b)(3)	2	Emergency Landing Conditions - Occupant Protection	Analysis and Test iaw Test Plan TR1006.02		X	Forward deflection or failure of basket poses no threat to occupants of cabin.
29.561(c)	2	Emergency Landing Conditions - Items of Mass	Compliance with 29.561 (b)(3)		X	29.337 Maneuvering Load are critical vertical loads.
29.561(d)	2	Emergency Landing Conditions - Internal fuel tanks	N/A		X	Installation not in area of internal fuel tanks
Subpart D – Design and Construction						
29.601	2	Design	Drawings		X	Design is conventional.
29.603	2	Materials	Drawings		X	Materials used are specified in Mil-Hdbk-5J.
29.605	2	Fabrication Methods	Drawings		X	Design is conventional.
29.609	2	Protection of Structure	Drawings		X	
29.611	2	Inspection Provisions	Drawings		X	Design is easy to inspect.
29.613	2	Material Strength Properties and Design Values	Values used as per AR-MMPDS-01		X	
29.625	2	Fitting Factor	Analysis		X	
29.727	2	Reserve Energy Drop Test	Statement in Report	X		
29.783	2	Doors	Statement in Report	X		Installation sits above bottom edge of door at aft end but does not block doors from opening.

Airworthiness Requirement	FAR 29 Amdt.	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
29.787(a)	2	Cargo and Baggage Compartments	Compliance with 23.301 through 307		X	JAN 20 2015
29.787(b)	2	Cargo and Baggage Compartments	Design		X	Basket is a closed container.
29.787(c)	2	Cargo and Baggage Compartments	N/A			Cargo is external to helicopter.
29.807	2	Emergency Exits	Statement in report		X	Installation does not block doors from opening, and does not block emergency access panels built into doors. JAN 20 2015
29.1387	9	Position Light System Dihedral Angles	N/A – statement in report			No change from Type Approval.
29.1401	11	Anticollision Light System	N/A – statement in report			No change from Type Approval.
Subpart G – Operating Limitations and Information						
29.1505	3	Never Exceed Speed	Flight Test,	X		V _{NE} limits to be determined by flight test
			Flight Manual Supplement			
29.1525	2	Kinds of Operation	Flight Manual Supplement	X		Limited to VFR only.
29.1529	2	Maintenance Manual	ICA Provided	X		
29.1557(a)	2	Miscellaneous Markings and Placards – Baggage Compartments	Placard on lid		X	JAN 20 2015
29.1581	15	Rotorcraft Flight Manual – General	Flight Manual Supplement	X		
29.1583(c)	2	Operating Limitations – Weight and Loading Information	Flight Manual Supplement	X		
29.1585	2	Operating Procedures	Flight Manual Supplement	X		
29.1587	2	Performance Information	Flight Manual Supplement	X		
29.1589	2	Loading Information	Flight Manual Supplement & Placard	X		Placard installed on basket lid

CONFORMITY INSPECTION RECORD – Flight Test Articles

Applicant Aero Design Ltd.	Aeronautical Product				Title of Change Cargo Basket Installation (1006 Configuration)
	Make Bell	Model 212	Serial No.	Registration	
Drawing No.	Applicant's Inspector		T.C. Inspection		Findings
	Signature	Date	Signature	Date	
100610, Rev. 0A P/N 100610-02 (Basket, Extended Lid) S/N 100602-01	<i>Olada Keh</i> M795441	Dec 1/14	<i>[Signature]</i>	DEC 23 2014	/
100630, Rev. 0B P/N 100630-01-01 (Low LH Fwd Beam)	<i>Olada Keh</i> M795441	Dec 1/14	<i>[Signature]</i>	DEC 23 2014	
100631, Rev. 0B P/N 100631-01-01 (Low LH Aft Beam)	<i>Olada Keh</i> M795441	Dec 1/14	<i>[Signature]</i>	DEC 23 2014	
100632, Rev. 0B 100632-01-02 (High RH Fwd Beam)	<i>Olada Keh</i> M795441	Dec 1/14	<i>[Signature]</i>	DEC 23 2014	
100633, Rev. 0B 100633-01-02 (High RH Aft Beam)	<i>Olada Keh</i> M795441	Dec 1/14	<i>[Signature]</i>	DEC 23 2014	
100635, Rev. 0B 100635-01, -02, -03 (Struts, drag link)	<i>Olada Keh</i> M795441	Dec 1/14	<i>[Signature]</i>	DEC 23 2014	

CONFORMITY INSPECTION RECORD – Flight Test Articles

APPLICANT'S ATTESTATION

I hereby confirm that the prototype installation for the subject

☒ MODIFICATION,

☐ REPAIR,

☐ TSO/AP-TC ARTICLE

is in conformity with the applicable installation drawing(s) listed above
and that necessary ground tests have been carried out.
[Please check (✓) the applicable box.]

Additional Information:

Mounting beams and struts are not painted or powder coated as specified – does not affect flight test.

Signature: *John Rahn 14795441*

TC INSPECTION

☒ ACCEPTABLE



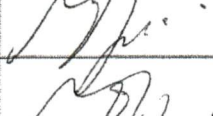

☐ UNACCEPTABLE

Remarks:

Signature: _____



CONFORMITY INSPECTION RECORD – Flight Test Installation

Applicant Aero Design Ltd.	Aeronautical Product				Title of Change Cargo Basket Installation (1006 Configuration)
	Make	Model	Serial No.	Registration	
	Bell	212	30702	C-GWWL	
Drawing No.	Applicant's Inspector		T.C. Inspection		Findings
	Signature	Date	Signature	Date	
100602, Rev. 0A 100602-01-01 (Basket Installation Extended Lid, LH Low Mounted)	Aasa Rehm M795441	Dec 1/14		DEC 23 2014	/
100602, Rev. 0A 100602-02-02 (Basket Installation Extended Lid, RH High Mounted)	Aasa Rehm M795441	Dec 1/14		DEC 23 2014	
100605, Rev. 0PD1 100605-01-01 (Provisions Install'n, LH Low Mounted)	Aasa Rehm M795441	Dec 1/14		DEC 23 2014	
100606, Rev. 0PD1 100606-01-02 (Provisions Install'n, RH High Mounted)	Aasa Rehm M795441	Dec 1/14		DEC 23 2014	

CONFORMITY INSPECTION RECORD – Flight Test Installation

APPLICANT'S ATTESTATION

I hereby confirm that the prototype installation for the subject

☒ MODIFICATION,

☐ REPAIR,

☐ TSO/AP-TC ARTICLE

is in conformity with the applicable installation drawing(s) listed above
and that necessary ground tests have been carried out.
[Please check (✓) the applicable box.]

Additional Information:

Drawings 100605 Rev. 0 PD1 and 1006 Rev. 0 PD1 are prototype disposition drawings showing the deviations from drawings 100605 Rev. 0 Chg. B and 100606 Rev. 0 Chg. B, as installed on the helicopter in advance of flight testing. The deviations are the use of different lengths of bolts than specified, and the corresponding number and/or thickness of washers required to set the nuts used on the bolts in safety.

Signature: Jose Rehn M752441

TC INSPECTION

☒ ACCEPTABLE

☐ UNACCEPTABLE

Remarks:

Signature: _____



ENGINEERING REPORT

ER1006.01

BELL 205, 212, 214, 412

MEGA CARGO BASKET INSTALLATION

COMPLIANCE REPORT

Prepared by: Jeff Clarke, P.Tech.(Eng.)

Revision 0, 16 January 2015

Aero Design Ltd.



9888A Malaspina Road, Powell River, BC, V8A 0G3

Phone: 604-483-2376

Fax: 604-483-2372

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1.0 INTRODUCTION

This report details the method of compliance for the paragraphs of FAR 29 listed in Certification Plan CP1006. It includes:

- generation of the applied loads to be used for the analysis and load testing used in the structural certification of the cargo basket and mounts
- analysis of reactions on the airframe
- certification statements related to ground clearance, doors, and lights.

2.0 REFERENCE TEXT

Aero Design Ltd. Engineering Report ER751.01, Revision 0, dated 18 July 2007, approved by E. Burgoin, DAR 290M

Aero Design Ltd. Test Report TR751.02, Revision 0, dated 31 August 2007, approved by E. Burgoin, DAR 290M

Aero Design Ltd. Flight Test Plan and Report FTP751.03, Revision 0, dated 06 September 2007, approved by E. Burgoin, DAR 290M

Aero Design Ltd. Engineering Report ER800.01, Revision 0, dated 18 July 2007, approved by E. Burgoin, DAR 290M

Aero Design Ltd. Engineering Report ER955.01, Revision 0, dated 20 January 2012, approved by E. Burgoin, DAR 290M

Aero Design Ltd. Flight Test Plan and Report FTP955.03, Revision 0, dated 27 January 2012, approved by E. Burgoin, DAR 290M

Aero Design Ltd. Load Test Plan and Report TR1006.02, Revision 0, dated 05 December 2014

Aero Design Ltd. Installation Drawings:

75103, Revision 0 – Cargo Basket Installation (Model 751, 1006 Mounting Provisions)

95502, Revision 0 – Cargo Basket Installation (Model 955, 1006 Mounting Provisions)

80003, Revision 0 – Cabin Step Installation (1006 Mounting Provisions)

100601, Revision 0 – Cargo Basket Installation (Standard Lid)

100602, Revision 0 – Cargo Basket Installation (Extended Lid)

100605, Revision 0 – Mounting Provisions Installation (Low Mount)

100606, Revision 0 – Mounting Provisions Installation (High Mount)

Aero Design Ltd. Fabrication Drawings:

100610, Revision 0 – Cargo Basket Assembly

100611, Revision 0 – Basket Body Assembly

100612, Revision 0 – Lid Assembly

100613, Revision 0 – Extended Lid Assembly

100630, Revision 0 – Forward Mounting Beam Fabrication (Low Mount)

100631, Revision 0 – Aft Mounting Beam Fabrication (Low Mount)
100632, Revision 0 – Forward Mounting Beam Fabrication (High Mount)
100633, Revision 0 – Aft Mounting Beam Fabrication (High Mount)
100635, Revision 0 - Struts

3.0 BASIS OF CERTIFICATION

Bell 205A, 205A-1	TCDS H1SW Issue 24
Bell 205B	TCDS H-104 Issue 3 (H1SW Issue 24)
Bell 212, 412, 412EP, 412CF	TCDS H-86 Issue 12
Bell 214B, 214B-1	TCDS H-80 Issue 3

Bell 412CF, TCDS H-86, Issue 12 (latest of all models):

FAR Part 29 dated 1 February 1965; Amendments 29-1 and 29-2; and FAR 29.473, 29.663, 29.771, 29.903(c), 29.1323, and 29.1505(b) of Amend. 29-3; 29.1457 of Amend. 29-6; 29.1397 of Amend. 29-7; 29.1387 of Amend. 29-9; 29.1401, of Amend 29-11; 29.939(c) and 29.1322 of Amend. 29-12; 29.1335, 29.1351 of Amend. 29-14; 29.1353, 29.1581 of Amend. 29-15; 29.1545 of Amend. 29-17; 29.1321 of Amend 29-21; 29.151, 29.161, 29.672, 29.1303, 29.1309, 29.1325, 29.1329, 29.1331, 29.1333, 29.1355, 29.1357, 29.1555, 29.1559 of Amend. 29-24; 29.1459 of Amend 29-25; 29.1549 of Amend. 29-26; 29.501 of Amend 29-30; Appendix B to Part 29 of Amend. 29-31; 29.2 of Amend 29-32.

4.0 LOADS

4.1 Load Factors

BELL 412 HELICOPTER LOAD FACTORS, FAR 29:

FAR 29.561(b)(3)

Ultimate Upward Emergency Landing Load Factor: $n_{e_up} := 1.5$

Ultimate Forward Emergency Landing Load Factor: $n_{e_fwd} := 4.0$

Ultimate Sideward Emergency Landing Load Factor: $n_{e_side} := 2.0$

Ultimate Downward Emergency Landing Load Factor: $n_{e_down} := 4.0$

FAR 29.625 Fitting Factor (does not apply to articles being tested): $n_{ff} := 1.15$

FAR 29.303 Safety Factor: $n_{sf} := 1.5$

FAR 29.337(a)

Limit Positive Manoeuvring Load Factor: $n_{man} := 3.5$

$n_{man_ult} := n_{man} \cdot n_{sf}$ Ultimate Positive Manoeuvring Load Factor: $n_{man_ult} = 5.25$

Limit Negative Manoeuvring Load Factor: $n_{man_neg} := -1.0$

$n_{man_neg_u} := n_{man_neg} \cdot n_{sf}$ Ultimate Negative Manoeuvring Load Factor: $n_{man_neg_u} = -1.5$

CRITICAL ULTIMATE LOAD FACTORS:

Downward: Ultimate Positive Manoeuvring Load Factor: $n_{man_ult} = 5.25$

Forward: Ultimate Forward Emergency Landing Load Factor: $n_{e_fwd} = 4$

Sideward: Ultimate Sideward Emergency Landing Load Factor: $n_{e_side} = 2$

Upward: Ultimate Upward Emergency Landing Load Factor: $n_{e_up} = 1.5$

Note: The basket is mounted below and to one side of the cabin. Forward deflection or failure in the emergency landing condition does not endanger the occupants. Likewise, Sideward and Upward deflection or failure of the basket in the emergency landing condition do not endanger the occupants.

Sideward and Upward Load Factors are used in the tests to ensure that the lid of the basket does not open in flight.

4.2 Loads Overview

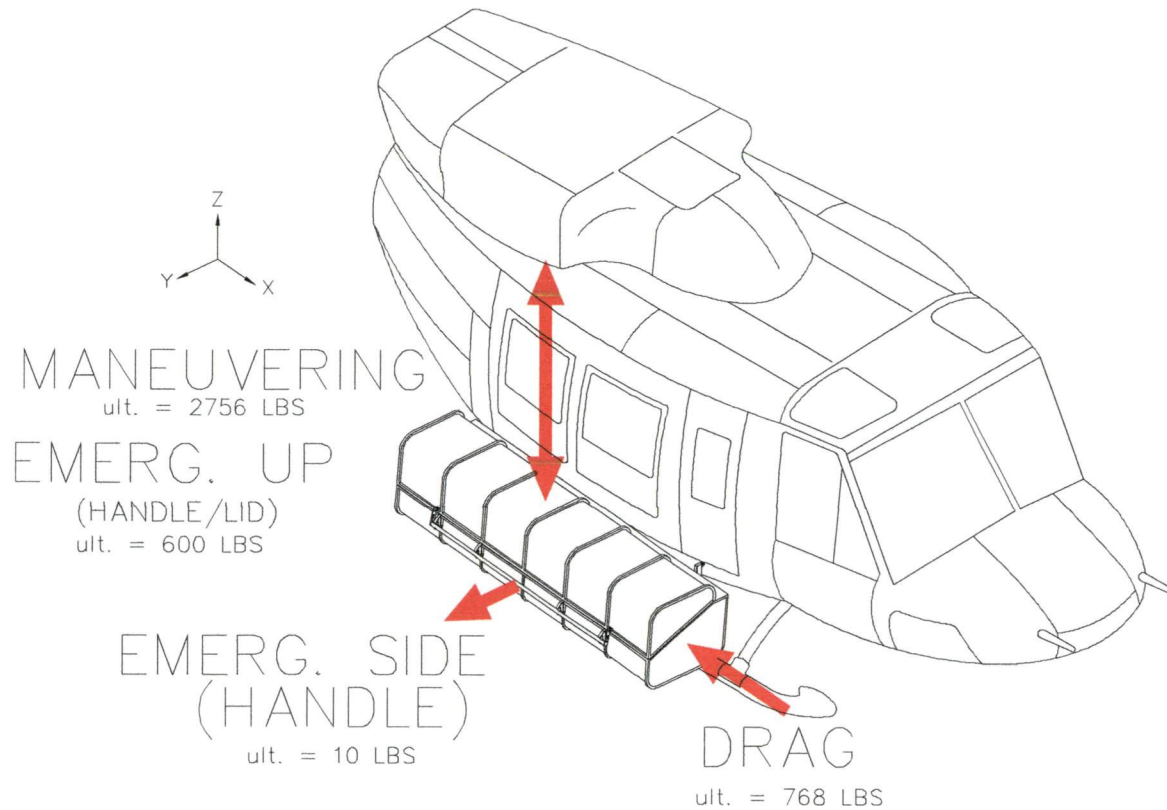


Figure 4.2.1 – Overview of Applied Loads

4.3 Inertia Loads

4.3.1 Weights

$$W_{\text{basket}} = 125 \cdot \text{lbf}$$

Weight of basket (overestimated)
(actual 115 lb including optional configurations)

$$W_{\text{cargo}} := 400 \cdot \text{lbf}$$

Weight of cargo (max)

$$P_{\text{basket}} := W_{\text{basket}} + W_{\text{cargo}}$$

$$P_{\text{basket}} = 525 \cdot \text{lbf}$$

Combined weight of basket and cargo

$$W_{\text{mounts}} := 10.3 \cdot \text{lbf}$$

Weight of mounting provisions installation

$$W_{\text{handle}} := 5 \cdot \text{lbf}$$

Weight of handle assembly

4.3.2 Positive Maneuvering Load

$$P_{lim_man} := P_{basket} \cdot n_{man}$$

$$P_{lim_man} = 1838 \cdot \text{lbf}$$

Limit positive maneuvering load due to basket and cargo

$$P_{ult_man} := P_{basket} \cdot n_{man_ult}$$

$$P_{ult_man} = 2756 \cdot \text{lbf}$$

Ultimate positive maneuvering load due to basket and cargo

4.3.3 Negative Maneuvering Load / Emergency Up Load

Demonstration of the positive maneuvering load condition is sufficient to demonstrate the negative maneuvering condition for the basket and mounting provisions. See section 5.2.

The ultimate negative maneuvering load and emergency upward loads are the same. The lid and handle arrangement must restrain the cargo under the negative maneuvering load condition.

$$P_{lim_cargo_neg} := W_{cargo} \cdot n_{man_neg}$$

$$P_{lim_cargo_neg} = -400 \cdot \text{lbf}$$

Limit negative maneuvering load due to cargo

$$P_{ult_cargo_neg} := W_{cargo} \cdot n_{man_neg_u}$$

$$P_{ult_cargo_neg} = -600 \cdot \text{lbf}$$

Ultimate negative maneuvering load due to cargo

4.3.4 Emergency Side Load

The handle must remain latched under the emergency side load condition.

$$P_{ult_side} := W_{handle} \cdot n_{e_side}$$

$$P_{ult_side} = 10 \cdot \text{lbf}$$

Ultimate sideward load on handle assembly

4.4 Drag Loads

$$l_{basket} := 108.75 \text{ in}$$

Length of basket.

$$w_{basket} := 30.5 \text{ in}$$

Width of basket.

$$h_{basket} := 28.7 \text{ in}$$

Height of basket.

$$A_f := 670.9 \text{ in}^2$$

Frontal Area of basket.
(standard lid)

$$A_f := 817.6 \text{ in}^2$$

Frontal Area of basket.
(high lid)

$$A_p := l_{\text{basket}} \cdot w_{\text{basket}}$$

$$A_p = 3317 \text{ in}^2$$

Planar Area of basket.

$$\frac{l_{\text{basket}}}{h_{\text{basket}}} = 3.8$$

Fineness ratio of basket

$$C_{Do} := 1.1$$

Drag Coefficient of Basket, (overestimated)
(Ref. Hoerner, Fluid Dynamic Drag, Figure 22).

$$\rho := 0.002378 \frac{\text{slug}}{\text{ft}^3}$$

Density of air at Sea Level.

$$V_{ne} := 140 \text{ knots}$$

Never-Exceed-Speed of Bell 412.
(Ref. Bell 412 Flight Manual.)
(Highest of 205, 212, 214 and 412)

$$V_d := \frac{V_{ne}}{0.9}$$

$$V_d = 156 \cdot \text{knots}$$

Design Dive Speed of Bell 412

$$P_{\text{drag}} := \frac{\rho}{2} \cdot V_d^2 \cdot A_p \cdot C_{Do}$$

$$P_{\text{drag}} = 512 \cdot \text{lbf}$$

Limit Drag on basket with high lid.

$$P_{\text{drag_ult}} := P_{\text{drag}} \cdot n_{sf}$$

$$P_{\text{drag_ult}} = 768 \cdot \text{lbf}$$

Ultimate Drag load on basket with high lid

$$AC_{\text{drag}} := 64.7 \cdot \text{in}$$

Lateral Aerodynamic Center of basket.

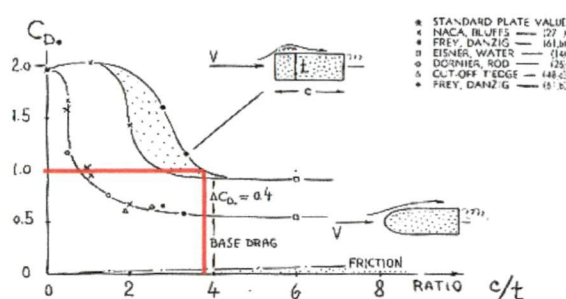


Figure 22. Drag coefficient of "rectangular" sections (tested between walls) with blunt leading edge (upper part) and with rounded shape (lower part), against length ratio.

Figure 4.4.1 – Figure 22 of Fluid Dynamic Drag by

Drag loads accepted by Jack Staal, Transport Canada PNR Region, 12 November 2014.

5.0 STRUCTURAL COMPLIANCE

5.1 Combined Positive Maneuvering and Drag Load Condition

Structural compliance for the basket assembly and mounting beams is demonstrated by test, see load test plan and report TR1006.02. The required applied loads are:

$P_{lim_man} = 1838 \text{ lbs}$	Limit positive maneuvering load due to basket and cargo
$P_{lim_drag} = 512 \text{ lbs}$	Limit drag load
$P_{ult_man} = 2756 \text{ lbs}$	Ultimate positive maneuvering load due to basket and cargo
$P_{ult_drag} = 768 \text{ lbs}$	Ultimate drag load

5.2 Negative Maneuvering Load Condition

The loads from the positive maneuvering condition are 3.5 times higher in magnitude and applied in the opposite direction to the negative maneuvering condition.

The mounting beam is a symmetrical tube section, therefore the bending moments on the tube as demonstrated by the positive maneuvering load are sufficient to demonstrate the negative maneuvering load.

The struts connecting the bottom of the beam to the fuselage change from a compression member to a tension member in the negative maneuvering condition. The critical load in the aft strut:

$$P_{tension} = 1924 \text{ lbs} / 3.5 \quad \text{Ultimate tension in aft strut member}$$

Where 1924 lbs = ultimate compression in positive maneuvering condition, see section 5.6

$$P_{tension} = 550 \text{ lbs}$$

The struts are $\frac{3}{4}$ " x 0.065 stainless steel tube.

$$A_{tube} = 0.14 \text{ in}^2 \quad \text{Cross sectional area of strut tube}$$

$$F_{tu} = P_{tension} / A_{tube}$$

$$F_{tu} = 3929 \text{ psi} \quad \text{Ultimate tensile stress on strut tube}$$

The loads are not significant and by inspection can be supported by the strut assembly.

The fasteners attaching the beams and struts are all demonstrated to support the higher shear, bearing and tension loads (as applicable) of the positive maneuvering condition.

The basket lid must remain closed under the negative maneuvering load condition. Structural compliance for the basket assembly is demonstrated by test, see load test plan and report TR1006.02. The required applied loads are:

$P_{lim_cargo_neg} = -400 \text{ lbs}$	Limit negative maneuvering load due to cargo
$P_{ult_cargo_neg} = -600 \text{ lbs}$	Ultimate negative maneuvering load due to cargo

5.3 Forward Emergency Landing Load Condition

The basket is located below the cabin. Forward deflection of the basket does not endanger the occupants in a crash.

5.4 Sideward Emergency Landing Load Condition

Sideward deflection of the basket does not endanger the occupants. The basket lid must remain closed in the sideward loading condition. The handle assembly is demonstrated to remain closed under 2g sideward load, see load test plan and report TR1006.02. The required load is:

$$P_{ult_side} = 10 \cdot \text{lbf} \quad \text{Ultimate sideward load on handle assembly}$$

The handle assembly was demonstrated to remain latched under the 2g sideward load.

When unlatched, the handle is held in to the basket with springs to engage a secondary safety catch included in the handle bracket. To ensure the handle will engage the secondary catch in the event it is not latched correctly, it must be held inward under the same 2g side load. The original springs did not support the 2g side load, as indicated in TR1006.02. Stiffer springs made of larger diameter wire (0.072" vs. 0.065") were tested on 22 December 2014 and found to support the 2g load.

5.5 Upward Emergency Landing Load

Upward deflection of the basket does not endanger the occupants. The upward emergency landing condition is demonstrated by the negative maneuvering condition. See section 5.2.

5.6 Helicopter Attachments

Assuming 1/2 cargo load is carried at each attachment.

$$P_{end} := \frac{W_{basket}}{2} + \frac{W_{cargo}}{2}$$

$$P_{end} = 262.5 \cdot \text{lbf}$$

Total weight on each end of basket

Where:

$$W_{basket} = 125 \text{ lbf}$$

Weight of basket

$$W_{cargo} = 400 \text{ lbf}$$

Weight of cargo

$$P_{lim_end} := P_{end} \cdot n_{man}$$

$$P_{lim_end} = 919 \cdot \text{lbf}$$

Limit load due to basket installation on fwd/aft attachment

Where:

$$n_{man} = 3.5$$

$$P_{ult_end} := P_{end} \cdot n_{man_ult}$$

$$P_{ult_end} = 1378 \cdot \text{lbf}$$

Ultimate load due to basket installation on fwd/aft attachment

Where:

$$n_{man_ult} = 5.25$$

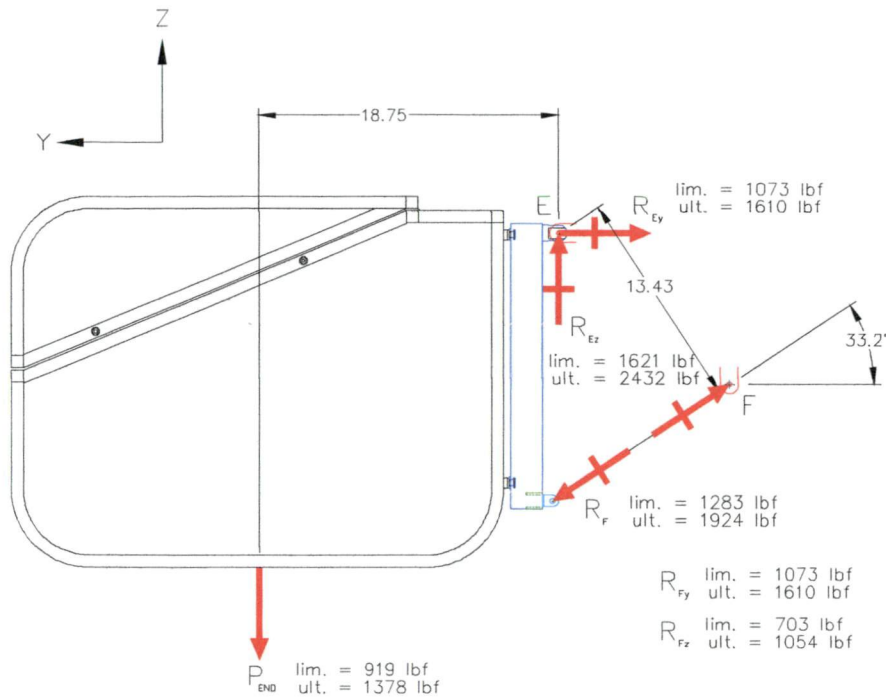


Figure 5.6.1 – Positive maneuvering load reactions (looking aft)

Reaction from basket on helicopter attachments:

Sum moments about E = 0:

$$R_F := \frac{P_{ult_end} \cdot 18.75 \text{ in}}{13.43 \text{ in}}$$

$$R_F = 1924 \cdot \text{lbf}$$

Ultimate Compression in Strut at F

$$R_{Fy} := R_F \cdot \cos(33.2 \text{ deg})$$

$$R_{Fy} = 1610 \cdot \text{lbf}$$

Ultimate Lateral reaction at F

$$R_{Fz} := R_F \cdot \sin(33.2 \text{ deg})$$

$$R_{Fz} = 1054 \cdot \text{lbf}$$

Ultimate Vertical reaction at F

Sum forces horizontally = 0:

$$R_{Ey} := R_{Fy}$$

$$R_{Ey} = 1610 \cdot \text{lbf}$$

Ultimate Lateral reaction at E

Sum forces vertically = 0:

$$R_{Ez} := P_{ult_end} + R_{Fz}$$

$$R_{Ez} = 2432 \cdot \text{lbf}$$

Ultimate Vertical reaction at E

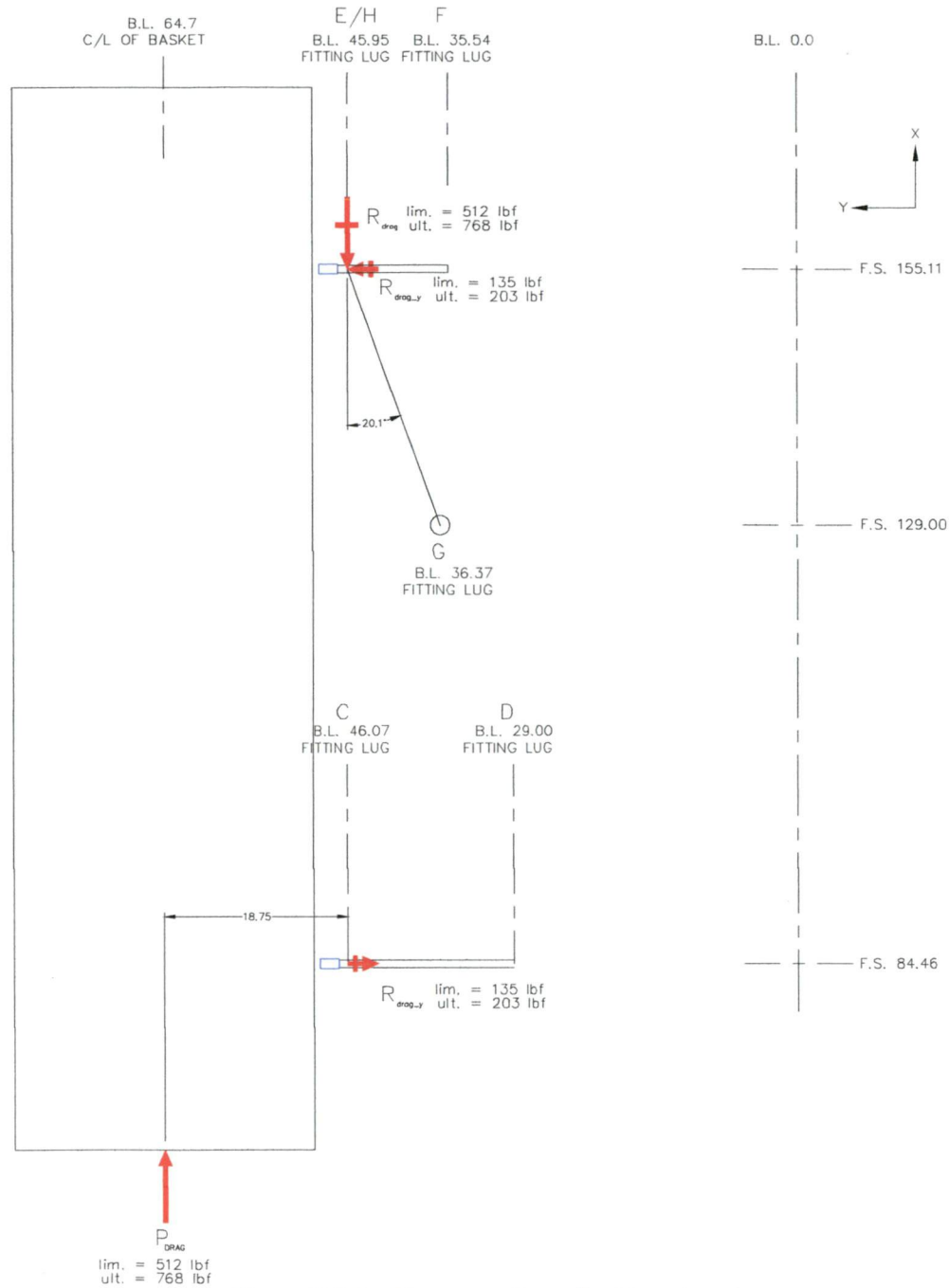


Figure 5.6.2 – Drag reactions (looking down)

Drag Reactions

Sum moments about C (looking down):

$$R_{\text{drag}_y} := \frac{P_{\text{drag_ult}} \cdot 18.75 \text{ in}}{71.0 \text{ in}}$$

$$R_{\text{drag}_y} = 203 \cdot \text{lbf}$$

Ultimate lateral reaction (Y direction) due to drag at aft attachment E

Aft beam is critical due to higher combined maneuvering loads, and has a drag link to support the fore/aft load. Drag is applied equally to upper and lower attachments. The drag link supports the longitudinal load at the bottom. Reaction on fuselage attachments:

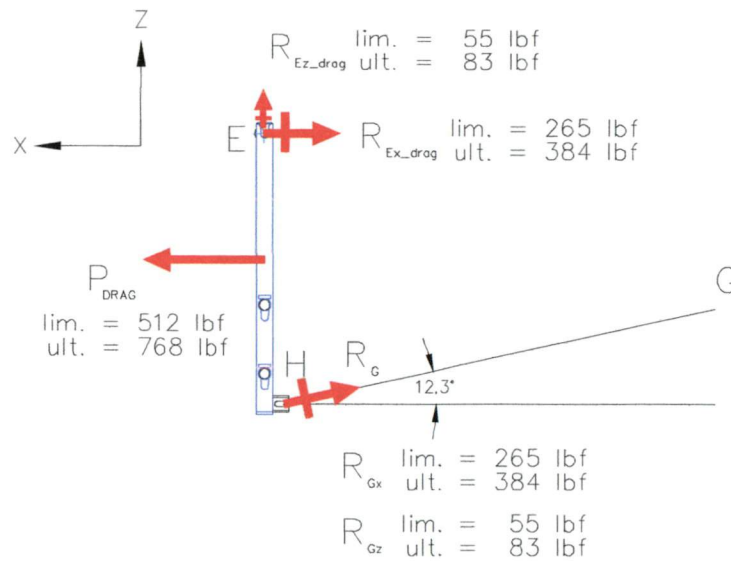


Figure 6.2.3 – Drag Reactions (looking inboard)

$$R_{Ex_drag} := \frac{P_{drag_ult}}{2}$$

$$R_{Ex_drag} = 384 \cdot \text{lbf}$$

Ultimate Longitudinal reaction at E

$$R_{Gx} := \frac{P_{drag_ult}}{2}$$

$$R_{Gx} = 384 \cdot \text{lbf}$$

Ultimate Longitudinal reaction at H/G (through drag link)

$$R_{Gy} := R_{Gx} \cdot \tan(20.1\text{-deg})$$

$$R_{Gy} = 140 \cdot \text{lbf}$$

Ultimate Lateral reaction at H/G (through drag link)

$$R_{Gz} := R_{Gx} \cdot \tan(12.3\text{deg})$$

$$R_{Gz} = 84 \cdot \text{lbf}$$

Ultimate Vertical reaction at H/G (through drag link)

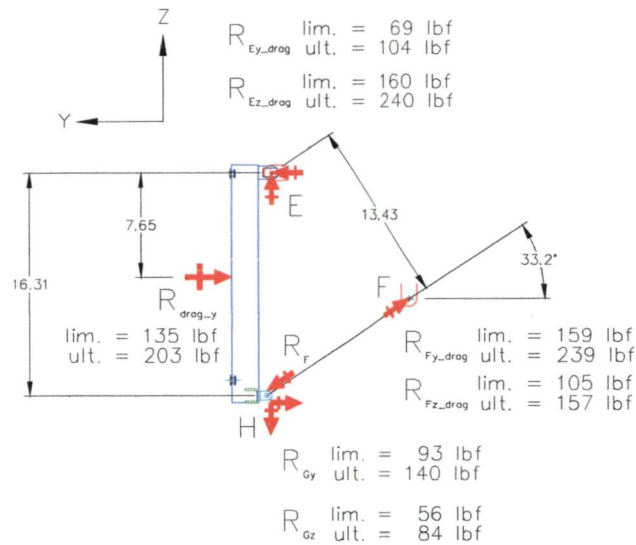


Figure 6.2.4 – Drag reactions (looking aft)

Sum moments about E = 0:

$$R_{F_drag} := \frac{(R_{drag_y} \cdot 7.65 \text{ in} + R_{Gy} \cdot 16.31 \text{ in})}{13.43 \text{ in}}$$

$$R_{F_drag} = 286 \cdot \text{lbf}$$

Ultimate Reaction in strut at H/F

$$R_{Fy_drag} := R_{F_drag} \cdot \cos(33.2 \text{ deg})$$

$$R_{Fy_drag} = 239 \cdot \text{lbf}$$

Ultimate Lateral reaction at H/F

$$R_{Fz_drag} := R_{F_drag} \cdot \sin(33.2 \text{ deg})$$

$$R_{Fz_drag} = 157 \cdot \text{lbf}$$

Ultimate Vertical reaction at H/F

Sum forces horizontally = 0:

$$R_{Ey_drag} := R_{drag_y} + R_{Gy} - R_{Fy_drag}$$

$$R_{Ey_drag} = 104 \cdot \text{lbf}$$

Ultimate Lateral reaction at E

Sum forces vertically = 0:

$$R_{Ez_drag} := R_{Fz_drag} + R_{Gz}$$

$$R_{Ez_drag} = 240 \cdot \text{lbf}$$

Ultimate Vertical reaction at E

Combined reactions on critical aft fuselage attachments due to positive maneuvering load and drag:

Outboard, point E

Vertical

$$R_{Ez_total} := R_{Ez} + R_{Ez_drag}$$

$$R_{Ez_total} = 2672 \cdot \text{lbf}$$

Ultimate total vertical load at E

Where:

$$R_{Ez} = 2432 \cdot \text{lbf}$$

Ultimate vertical load due to maneuvering load

$$R_{Ez_drag} = 240 \cdot \text{lbf}$$

Ultimate vertical load due to drag load

$$P_{z_allow_lim} := 3060 \cdot \text{lbf}$$

Limit allowable vertical load on upper hard points
(ref: Bell Service Letter 205A-39)

$$P_{z_allow_ult} := P_{z_allow_lim} \cdot n_{sf}$$

$$P_{z_allow_ult} = 4590 \cdot \text{lbf}$$

Ultimate allowable lateral load

$$MS := \left(\frac{P_{z_allow_ult}}{R_{Ez_total}} \right) - 1$$

$$MS = 0.7$$

MARGIN OF SAFETY IS POSITIVE

Lateral

$$R_{Ey_total} := R_{Ey} - R_{Ey_drag}$$

$$R_{Ey_total} = 1506 \cdot \text{lbf}$$

Ultimate total lateral load at E

Where:

$$R_{Ey} = 1610 \cdot \text{lbf}$$

Ultimate lateral load due to maneuvering load

$$R_{Ey_drag} = 104 \cdot \text{lbf}$$

Ultimate lateral load due to drag load

$$P_{y_allow_lim} := 1310 \cdot \text{lbf}$$

Limit allowable lateral load on upper hard points
(ref: Bell Service Letter 205A-39)

$$P_{y_allow_ult} := P_{y_allow_lim} \cdot n_{sf}$$

$$P_{y_allow_ult} = 1965 \cdot \text{lbf}$$

Ultimate allowable lateral load

$$MS := \left(\frac{P_{y_allow_ult}}{R_{Ey_total}} \right) - 1$$

$$MS = 0.3$$

MARGIN OF SAFETY IS POSITIVE

Longitudinal

$$R_{Ex_total} := R_{Ex_drag}$$

$$R_{Ex_total} = 384 \cdot \text{lbf}$$

Ultimate total longitudinal load at E

$$P_{x_allow_lim} := 1700 \cdot \text{lbf}$$

Limit allowable longitudinal load on upper hard points
(ref: Bell Service Letter 205A-39)

$$P_{x_allow_ult} := P_{x_allow_lim} \cdot n_{sf}$$

$$P_{x_allow_ult} = 2550 \cdot \text{lbf}$$

Ultimate allowable longitudinal load

$$MS := \left(\frac{P_{x_allow_ult}}{R_{Ex_total}} \right) - 1$$

$$MS = 5.6$$

MARGIN OF SAFETY IS POSITIVE

Inboard, point F - Strut at point F on beam cannot transfer a moment, therefore the axial loads are the same at the helicopter attachment point. There is no longitudinal applied load on the lower aft attachment point.

Vertical

$$R_{Fz_total} := R_{Fz} + R_{Fz_drag}$$

$$R_{Fz_total} = 1210 \cdot \text{lbf}$$

Ultimate total vertical load at F

Where:

$$R_{Fz} = 1054 \cdot \text{lbf}$$

Ultimate vertical load due to maneuvering load

$$R_{Fz_drag} = 157 \cdot \text{lbf}$$

Ultimate vertical load due to drag load

$$P_{z_allow_lim} := 1560 \text{ lbf}$$

Limit allowable vertical load on lower hard points
(ref: Bell Service Letter 205A-39)

$$P_{z_allow_ult} := P_{z_allow_lim} \cdot n_{sf}$$

$$P_{z_allow_ult} = 2340 \cdot \text{lbf}$$

Ultimate allowable vertical load

$$MS := \left(\frac{P_{z_allow_ult}}{R_{Fz_total}} \right) - 1$$

$$MS = 0.9$$

MARGIN OF SAFETY IS POSITIVE

Lateral

$$R_{Fy_total} := R_{Fy} + R_{Fy_drag}$$

$$R_{Fy_total} = 1849 \cdot \text{lbf}$$

Ultimate total lateral load at F

Where:

$$R_{Fy} = 1610 \cdot \text{lbf} \quad \text{Ultimate lateral load due to maneuvering load}$$

$$R_{Fy_drag} = 239 \cdot \text{lbf} \quad \text{Ultimate lateral load due to drag load}$$

$$P_{y_allow_lim} := 1310 \cdot \text{lbf}$$

Limit allowable vertical load on lower hard points
(ref: Bell Service Letter 205A-39)

$$P_{y_allow_ult} := P_{y_allow_lim} \cdot n_{sf}$$

$$P_{y_allow_ult} = 1965 \cdot \text{lbf}$$

Ultimate allowable lateral load

$$MS := \left(\frac{P_{y_allow_ult}}{R_{Fy_total}} \right) - 1$$

$$MS = 0.06$$

MARGIN OF SAFETY IS POSITIVE

Inboard, point G - Drag link member cannot transfer a moment, therefore the axial loads are the same at the helicopter attachment point.

Vertical

$$R_{Gz} = 84 \cdot \text{lbf}$$

Ultimate total vertical load at G

$$P_{z_allow_lim} := 1560 \text{ lbf}$$

Limit allowable vertical load on lower hard points
(ref: Bell Service Letter 205A-39)

$$P_{z_allow_ult} := P_{z_allow_lim} \cdot n_{sf}$$

$$P_{z_allow_ult} = 2340 \cdot \text{lbf}$$

Ultimate allowable vertical load

$$MS := \left(\frac{P_{z_allow_ult}}{R_{Gz}} \right) - 1$$

$$MS = 27$$

MARGIN OF SAFETY IS POSITIVE

Lateral

$$R_{Gy} = 140 \cdot \text{lbf}$$

Ultimate lateral load at G

$$P_{y_allow_lim} := 1310 \cdot \text{lbf}$$

Limit allowable lateral load on lower hard points
(ref: Bell Service Letter 205A-39)

$$P_{y_allow_ult} := P_{y_allow_lim} \cdot n_{sf}$$

$$P_{y_allow_ult} = 1965 \cdot \text{lbf}$$

Ultimate allowable lateral load

$$MS := \left(\frac{P_{y_allow_ult}}{R_{Gy}} \right) - 1$$

$$MS = 13.0$$

MARGIN OF SAFETY IS POSITIVE**Longitudinal**

$$R_{Gx} = 384 \cdot \text{lbf}$$

Ultimate longitudinal load at G

$$P_{x_allow_lim} := 1700 \cdot \text{lbf}$$

Limit allowable longitudinal load on lower hard points
(ref: Bell Service Letter 205A-39)

$$P_{x_allow_ult} := P_{x_allow_lim} \cdot n_{sf}$$

$$P_{x_allow_ult} = 2550 \cdot \text{lbf}$$

Ultimate allowable longitudinal load

$$MS := \left(\frac{P_{x_allow_ult}}{R_{Gx}} \right) - 1$$

$$MS = 5.6$$

MARGIN OF SAFETY IS POSITIVE**6.0 COMPLIANCE WITH FAR 29.727 - RESERVE ENERGY DROP TEST**

In the existing approved configuration (751) the bottom of the basket structure is located 7.3 inches below the lowest point on the fuselage, WL 7.44, with the bottom of the basket parallel to the floor (basket canted up relative to the ground). In the new configuration with low mounting beams (1006) the bottom of the basket hoops are located 7.5 inches below the lowest point on the fuselage, with the bottom parallel to the landing gear. The difference in clearance height is not critical.

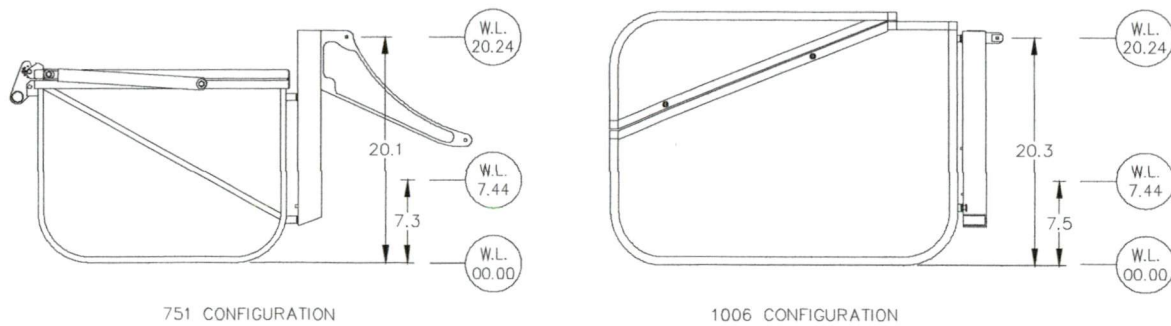


Figure 6.0.1 – Fuselage Clearance

When the aircraft is on low skid gear with the low mounting beams configuration (100605-01-XX) the basket has 6 inches of ground clearance. The forward lug for the ground handling wheels on the skid tube is located directly under the basket attachment hoop with minimal clearance (approximately 0.25 inch) at high gross weight. Any excess deflection of the skid tube during landing could drive the lug into the attachment hoop, therefore this combination of basket installation on low gear with low mounting beams is not permitted, as noted on drawings 100601 and 100602. This clearance increases by 5.25" with the 751 or 955 basket installed and is acceptable.

When the aircraft is on low skid gear with the high mounting beams configuration (100606-01-XX) the basket has 10.5 inches of ground clearance. This clearance increases by 5.25" with the 751 or 955 basket installed.

Advisory Circular AC29-2C 29.727A, section b. (2):

External accessories that may not impact the landing surface during drop testing include devices such as externally mounted fuel tanks or accessories likely to cause post-landing fires. Cameras, loudspeakers, and search lights may be damaged during deformations resulting from reserve energy drop tests if electrical connections are sufficiently protected to preclude electrical fires and the devices are not likely to penetrate fuel tanks.

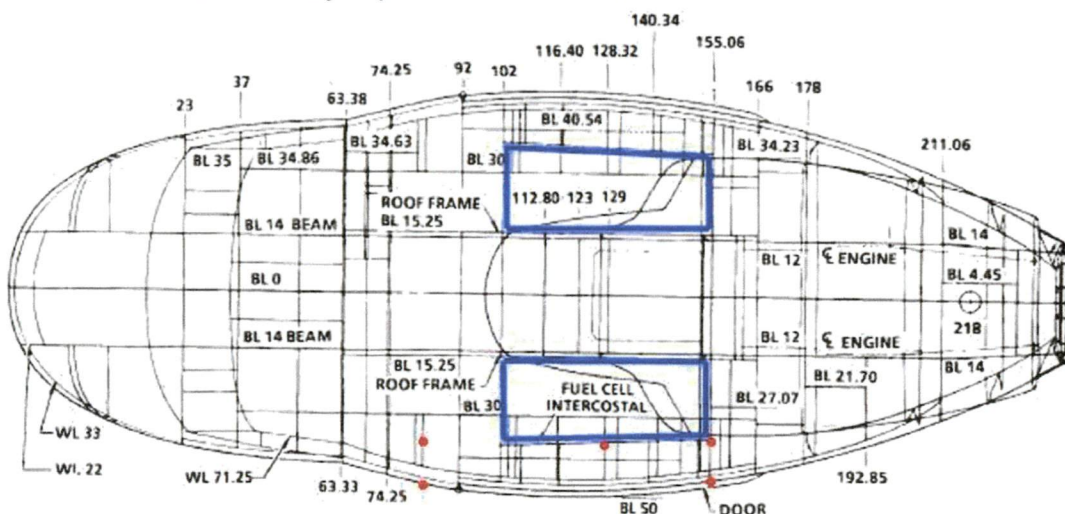


Figure 6.0.2 – Fuel Cell and Hard Point Locations
(fuel cell indicated in blue, hard points in red)

This installation does not include any items which could cause or contribute to a post landing fire. The basket is located outboard of the side of the fuselage. The forward hardpoints used with this installation are located 18 inches forward of the fuel cell, therefore are not in a position to penetrate the fuel cell. The aft mounting beam is oriented vertically outboard of the side of the fuselage and as such is not in a position to pierce the fuel cell. The aft lower hardpoint used for the aft strut is located on the outboard and aft frame for the fuel tank, on the outboard aft side of the frame, not in the bay with the fuel cell. The mid lower hard point used for the drag link is located on the outboard frame for the fuel cell. Upward loads on the basket experienced during an impact with the ground will pull on the aft strut, not push inward towards the fuel cell. None of the components in this installation are in a position likely to penetrate a fuel tank.

Advisory Circular AC29-2C 29.727A, section b. (2) (continued):

The expendable accessories, if installed, should also be designed to not have "hard points" that would unacceptably damage the rotorcraft structure under landing impacts by penetration into the occupied areas or fuel tanks. These expendable accessories should be designed with frangible fittings, frangible devices, or comparable design features. Also, these devices should be designed to not significantly alter the energy absorbing ability or design features of the landing gear.



Figure 6.0.3 – Landing Gear Clearance on High Gear

The cargo basket installation in the low mounted position on high landing gear locates the basket in the closest position to the landing gear, low gear is further inboard. There is approximately 3 inches of clearance (perpendicular from cross tube to basket) over the forward

and aft cross tubes. The area of the basket over the cross tube is expanded metal mesh, with the frames located beyond the cross tubes. Deflection of the landing gear sufficient to allow the cross tubes to contact the basket will push the cross tubes into the mesh, deforming the mesh around the cross tube. The concentrated contact area of the cross tube with the mesh will not require much force to deform the mesh, on the order of a hundred pounds, and therefore will not significantly alter the energy absorbing ability of the landing gear.

7.0 COMPLIANCE WITH FAR 29.783 – DOORS

Installation of the cargo basket and mounting provisions does not interfere with the operation of the existing sliding cabin door or pilot door. See section 8 for pictures.

FAR 29.783 – Doors (original issue - per basis of certification):

(a) Each closed cabin must have at least one adequate and easily accessible external door.

No Change from Type Approved configuration.

(b) No passenger door may be located with respect to any rotor disc so as to endanger persons following appropriate instructions for the use of that door.

No change from Type Approved configuration.

(c) There must be means for locking crew and external passenger doors and for preventing their opening in flight inadvertently or as a result of mechanical failure. It must be possible to open external doors from inside and outside the cabin with the rotorcraft on the ground. The means of opening must be simple, obvious, and so arranged and marked that it can be readily located and operated.

No change from Type Approved configuration.

(d) There must be reasonable provisions to prevent the jamming of any external door, in a minor crash, as a result of fuselage deformation.

No change from Type Approved configuration.

(e) There must be means for direct visual inspection of the locking mechanism by crewmembers to determine whether the external doors (including passenger, crew, service, and cargo doors) are fully locked. There must be visual means to signal to appropriate crewmembers when normally used external doors are closed and fully locked.

No change from Type Approved configuration.

(f) For outward opening external doors usable for entrance or egress, there must be an auxiliary safety latching device to prevent the door from opening when the primary latching mechanism fails. If the door does not meet the requirements of paragraph (c) of this section with this device in place, suitable operating procedures must be established to prevent the use of the device during takeoff and landing.

No change from Type Approved configuration.

8.0 COMPLIANCE WITH FAR 29.807 – PASSENGER EMERGENCY EXITS

Installation of the cargo basket and mounting provisions does not interfere with the operation of the existing emergency exit provisions built into the main cabin doors, and does not interfere with after-market emergency exit push-out windows.

In the low mount provisions configuration (installation drawing 100605), the mounting beams are located below the cabin door. The top of the basket installation with the standard lid (installation drawing 100601), is flush with the floor at the aft end, and is 4 inches below the floor at the forward end. The top of the basket installation with the extended lid (installation drawing 100602), the lid is 6 inches above the floor at the aft end and tapers to 2 inches above the floor at the forward end. This intrusion above the floor level will not impede egress from the helicopter from the main cabin door, see description of lids below, and will aid in egress from the emergency exit panels or push-out windows as the top of the basket is closer than the original cabin steps.

In the high mount provisions configuration (installation drawing 100606), the top of the forward beam is flush with the floor of the aircraft. The top of the aft beam, a 1"x2" tube, sits 4 inches above the floor. The aft beam is approximately centered on the aft-most outboard facing seat position. This seat is typically not occupied in operations using the cargo basket, and the small intrusion of the beam into the door area will not affect egress from the cabin. The top of the basket installation with the standard lid (installation drawing 100601), is 4" above floor level at the aft end, and tapers to level with the floor at the forward end. The top of the basket installation with the extended lid (installation drawing 100602), is 10" above floor level at the aft end and tapers to 6" above the floor at the front. This intrusion above the floor level will not impede egress from the helicopter from the main cabin door, see description of lids below, and will aid in egress from the emergency exit panels or push-out windows as the top of the basket is closer than the original cabin steps.

The standard lid of the basket includes 6 inch wide reinforced walkway sections to allow access over the basket from the cabin. The extended lid is 6" taller than the standard lid, and also includes a 6 inch wide reinforced walkway section down the centre. The basket has a covered flat section 6 inches wide inboard of the lid, adjacent to the cabin, that can be stepped on to access the top of the basket during egress from the cabin.



Figure 8.0.1 – Cargo basket with extended lid, installed on high mounting provisions



Figure 8.0.2 – Looking through cargo basket at aft door sill.

FAR 29.807 – Passenger Emergency Exits (original issue - per basis of certification):

(a) *Type.* For the purpose of this part...

No change from Type Approved configuration

(b) *Passenger emergency exits; side-of-fuselage.* Emergency exits must be accessible to the passengers and must be provided in accordance with the following table:...

No change from Type Approved configuration.

(c) *Passenger emergency exits; other than side-of-fuselage.* In addition to the requirements of paragraph (b) of this section—

(1) *There must be enough openings in the top, bottom, or ends of the fuselage to allow evacuation with the rotorcraft on its side; or*

(2) *The probability of the rotorcraft coming to rest on its side in a crash landing must be extremely remote.*

No change from Type Approved configuration.

(d) *Tests.* The proper functioning of each emergency exit must be shown by test.

No change from Type Approved configuration.

9.0 COMPLIANCE WITH FAR 29.1387 AND 29.1401 - LIGHTS

The helicopter is fitted with both upper and lower position and anti-collision lights. The lower position light is slightly blocked by the basket for the required 110° angle. The upper position light is above of the sliding crew door, and can be seen at any angle where the basket may block the lower position light. The lower anti-collision light is located under the fuselage, and is blocked by the basket from the side. The upper anti-collision light is located on top of the engine fairing and can be seen at any angle where the basket may block the lower anti-collision light. See figure 9.0.1 for light and basket position.

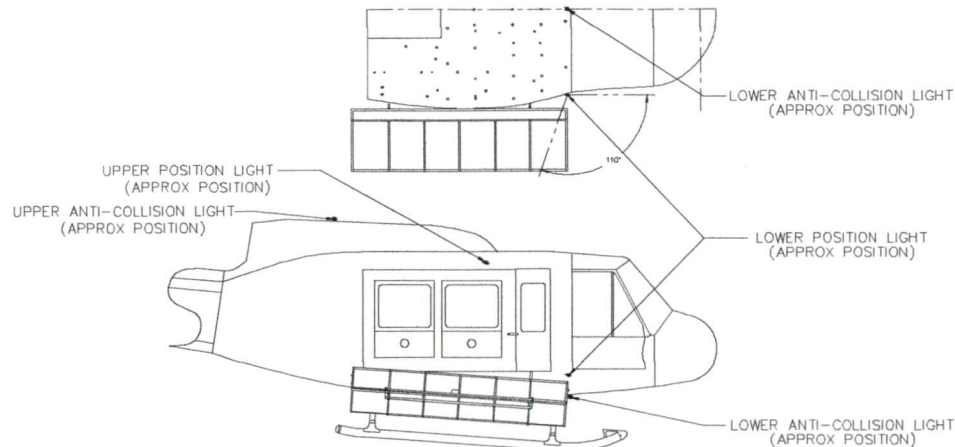


Figure 9.0.1 – Position and Anti-Collision Light Locations

10.0 OPTIONAL STEP INSTALLATION (DRAWING 100640)

The optional step installation is not required to meet a regulatory requirement, it is a requirement of some operating contracts. The installation consists of a tubular step attached to the outboard side of the basket assembly to aid access to the top of the basket in order to access the cabin. The step may be installed on the forward and/or aft end of the basket.

$$P_{\text{step}} := 200 \text{ lbf} \cdot 2.5$$

$$P_{\text{step}} = 500 \cdot \text{lbf}$$

Total load applied to step

Where:

200 lbf Weight of occupant

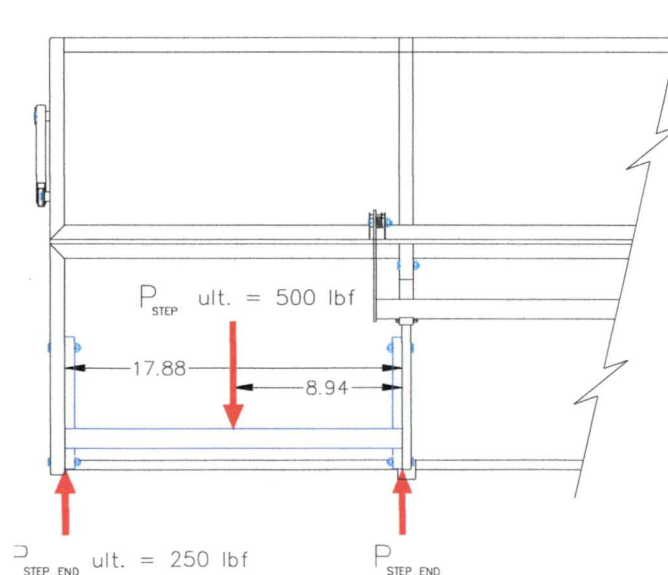
2.5 Load factor (jumping)

The load on the step is distributed to each end:

$$P_{\text{step_end}} := \frac{P_{\text{step}}}{2}$$

$$P_{\text{step_end}} = 250 \cdot \text{lbf}$$

Load on each end of step



SIDE VIEW

Figure 10.0.1 – Optional Step Loads

The critical condition is a point load applied at the centre of the step tube. Bending on step tube:

$$F_b = \frac{(M \cdot y)}{I}$$

$$I := \left(\frac{\pi}{4} \right) \cdot [(0.5 \text{ in})^4 - (0.435 \text{ in})^4]$$

$$I = 0.021 \cdot \text{in}^4$$

Moment of inertia of 1.0 x 0.065 round tube

$$F_b := \frac{[(P_{\text{step_end}} \cdot 8.94 \text{ in}) \cdot 0.5 \text{ in}]}{I}$$

$$F_b = 53 \cdot \text{ksi}$$

Bending stress

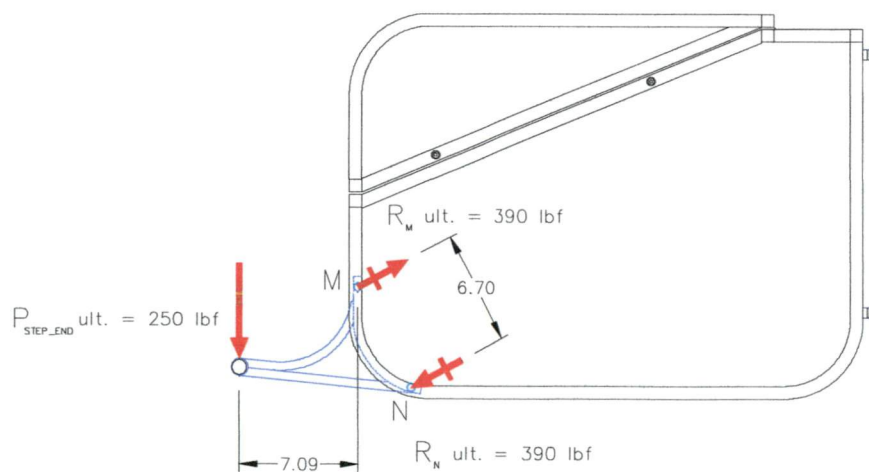
$$F_{\text{ty_tube}} := 30 \cdot \text{ksi}$$

Minimum yield tensile strength (Ref: ASTM A-554)

$$F_{\text{tu_tube}} := 70 \cdot \text{ksi}$$

Minimum ultimate tensile strength (Ref: ASTM A-554)

The applied load exceeds the minimum yield strength of the tube, so the tube may bend in a condition where it is jumped on. The applied load does not exceed the ultimate strength of the tube.



END VIEW

Figure 10.0.2 – Step Loads on Basket Assembly

Reaction from occupant on optional step on step attachments to basket:

Sum moments about M = 0:

$$R_N := \frac{P_{\text{step_end}} \cdot 7.09 \text{ in}}{6.7 \text{ in}}$$

$$R_N = 265 \cdot \text{lbf}$$

Reaction load at N due to step load (split equally between sides)
Same reaction at M

Vertical load is distributed equally to M and N

$$R_{Ny} := \frac{P_{\text{step_end}}}{2}$$

$$R_{Ny} = 125 \cdot \text{lbf}$$

Vertical reaction at N
Same reaction at M

The loads are added directly. This is conservative as it produces increased load over vector addition at each point.

$$R_{N_total} := R_N + R_{Ny}$$

$$R_{N_total} = 390 \cdot \text{lbf}$$

Total load at N and M (conservative)

The step is attached with AN 3 bolts. The bolts are loaded in shear.

$$P_{su_AN3} := 2125 \cdot \text{lbf}$$

Ultimate shear strength of AN3 bolt (ref: MIL-HDBK-5J)

$$MS := \left(\frac{P_{su_AN3}}{R_{N_total}} \right) - 1$$

$$MS = 4.5$$

Margin of safety

The step is attached through bushings welded into the step and basket assemblies. By inspection the loads are small enough that the bushings and tubes are not critical.

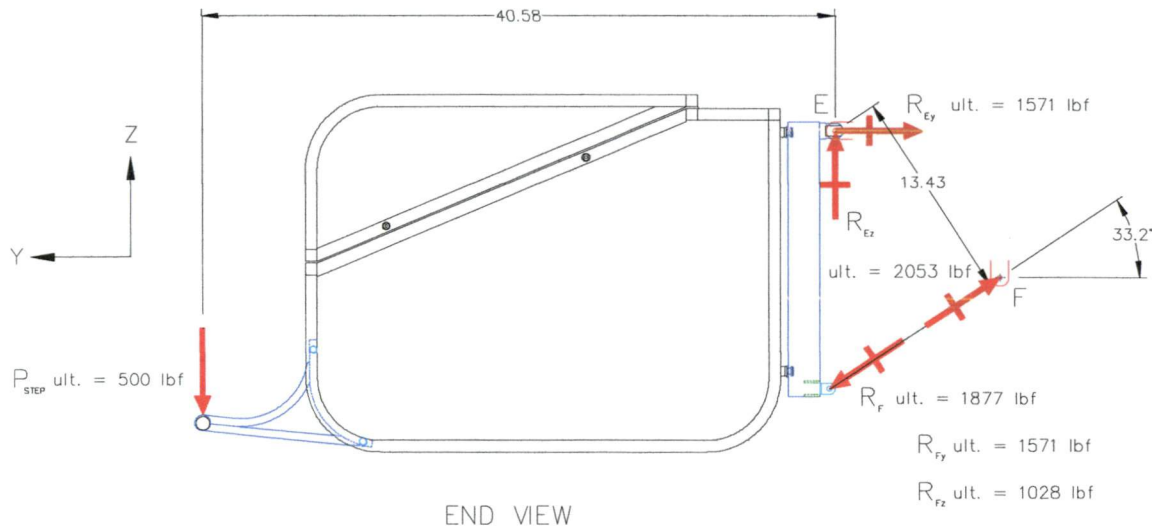


Figure 10.0.3 – Step Loads on Helicopter Attachments

Reaction from occupant jumping on step, with basket at full cargo load, on helicopter attachments:

Sum moments about E = 0:

$$R_F := \frac{P_{\text{step}} \cdot 40.58 \text{ in} + (W_{\text{basket}} + W_{\text{cargo}}) \cdot 0.5 \cdot 18.75 \text{ in}}{13.43 \text{ in}}$$

$$R_F = 1877 \cdot \text{lbf}$$

Ultimate Compression in Strut at F

Where:

$$W_{\text{basket}} = 125 \cdot \text{lbf} \quad \text{Weight of basket assembly}$$

$$W_{\text{cargo}} = 400 \cdot \text{lbf} \quad \text{Maximum cargo load}$$

$$0.5 \quad \text{load is carried between 2 attachments}$$

$$R_{Fy} := R_F \cdot \cos(33.2 \text{ deg})$$

$$R_{Fy} = 1571 \cdot \text{lbf}$$

Ultimate Lateral reaction at F

$$R_{Fz} := R_F \cdot \sin(33.2 \text{ deg})$$

$$R_{Fz} = 1028 \cdot \text{lbf}$$

Ultimate Vertical reaction at F

Sum forces horizontally = 0:

$$R_{Ey} := R_{Fy}$$

$$R_{Ey} = 1571 \cdot \text{lbf}$$

Ultimate Lateral reaction at E

Sum forces vertically = 0:

$$R_{Ez} := P_{\text{step}} + W_{\text{basket}} + W_{\text{cargo}} + R_{Fz}$$

$$R_{Ez} = 2053 \cdot \text{lbf}$$

Ultimate Vertical reaction at E

The reactions on the airframe attachment points do not exceed the loads applied by the basket installation at ultimate maneuvering load factor (reference section 5.6)

11.0 INSTALLATION OF CARGO BASKET MODELS 751 AND 955 AND CABIN STEP

The mounting provisions for this cargo basket installation, reference drawings 100605 and 100606, include additional keyways to accept cargo basket assemblies 75110-01 (Model 751) and 95510-01 (Model 955), and cabin step assembly 80010-7100. Both baskets are significantly smaller than this cargo basket, and are rated to carry a lower cargo load of 300 lbs.

Cargo basket model 751 has been demonstrated to support a cargo load of 300 lbs, reference engineering report ER751.01 Revision 0 and Test Report TR751.02 Revision 0, and was flight tested by TCCA on 11 December 2007.

Cargo basket model 955 has been demonstrated to support a cargo load of 300 lbs, reference engineering report ER955.01, and was company flight tested, reference Flight Test Report FTP955.03, Revision 0.

Cabin step assembly 80010-7100 has been demonstrated to support a load of 2 occupants at ultimate positive maneuvering load factor, reference engineering report ER800.01, Revision 0.

The loads demonstrated for the mounting provisions for this cargo basket installation are higher than the loads required for installation of cargo basket 751 and 955 and the cabin step assembly and as such installation of cargo baskets model 751 and 955 and cabin step

assembly 80010-7100 are acceptable for installation on mounting provisions installed in accordance with drawings 100605 and 100606.

The following drawings are provided for installation of the baskets or step using the 1006 configuration mounting provisions:

75103, Revision 0 – Model 751 basket on 1006 mounting provisions

95502, Revision 0 – Model 955 basket on 1006 mounting provisions

80003, Revision 0 – 80010-7100 cabin step on 1006 mounting provisions

APPENDIX A

BELL SERVICE LETTER 205A-39



SERVICE LETTER

NO. 205A-39

1 August 1969
35:OES:rb-3803

TO: All 205A/205A-1 Helicopter Operators

SUBJECT: EXTERNAL LOAD CARRYING HARD POINTS

REASON: Provide information concerning utilization and location of hard point fittings.

D.E.R. APPROVAL: *SW-122 E. M. Asplund*

HELICOPTERS AFFECTED: All 205A/205A-1 Helicopters

ACCOMPLISHMENT: N/A

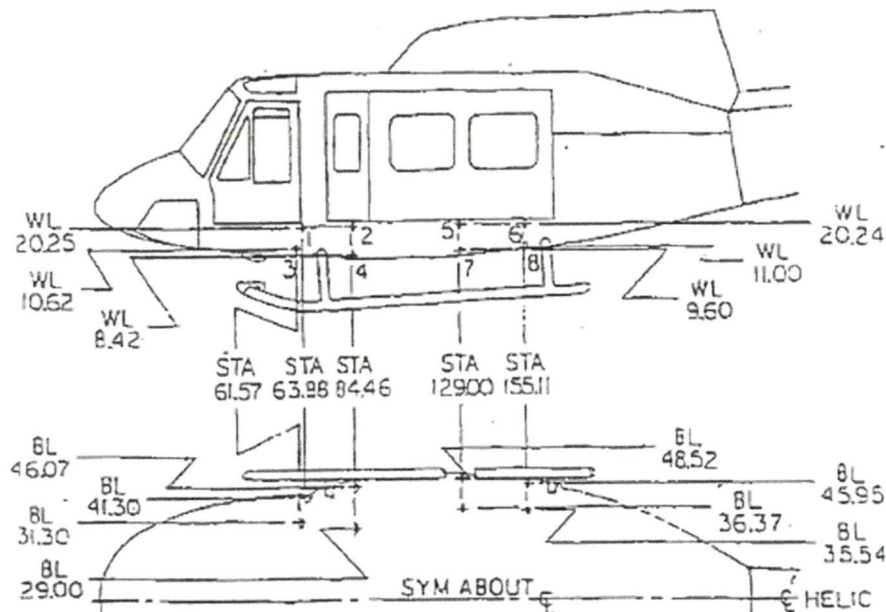
DESCRIPTION:

1. There are sixteen external load carrying hard point fittings (eight to a side) on the 205A/205A-1 helicopter. One pair of the fittings are located at each of the fuselage stations 61, 84 and 135. Two (2) sets of the aft hard point fittings are removed from fuselage station 129 due to the passenger step installation. These predrilled fittings are located in the loose equipment or stowed under the cabin floor on the left hand and right hand access door assemblies, P/N 205-032-142 -39 and -40. When they are required, it will be necessary to remove the passenger steps to install these fittings.
2. These fittings are designed for the following limit loads acting simultaneously. Upper hard points vertical 3060 pounds, side (lateral) 1310 pounds; lower hard points vertical 1560 pounds, side (lateral) 1310 pounds.
3. In addition to the above loads, each fitting is designed to a limit forward or aft load of 1700 pounds.
4. In order to assist the customer in attaching external loads, Bell Helicopter has an external stores support kit P/N 205-706-013-11 available through the Spares Department.

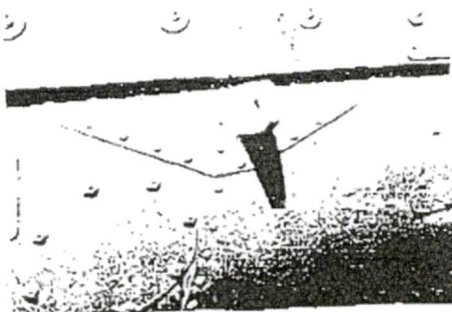
CHIEF OF ENGINEERING *Joe R. Beebe*
Wm. J. Diehl
Manager Service
DO NOT REMOVE FROM THIS FILE

EXTERNAL HARDPOINTS: MODELS 205, 212, 214B & 412

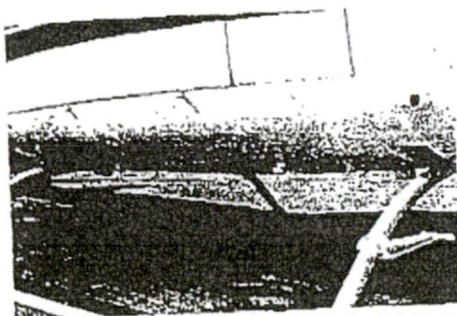
FUSELAGE LOCATIONS AND ALLOWABLE ULTIMATE LOADS



CAUTION: Helicopter C.G. limits must be maintained for all equipment or stores configurations which attach to any or all of these hard-points.



Provisions to attach special equipment externally on the lower fuselage are provided as part of the basic airframe. Nine hard point fittings are mounted on each side. The most forward hard point is part of the jacking/mooring point. Four fittings make up the forward cluster and four make up the aft cluster.



Each cluster is designed to carry a load of 340 kilograms, 750 pounds, with the center of gravity between the pairs and about 38 centimeters, 15 inches outboard of the widest part of the fuselage.

TEST PLAN AND REPORT

TR1006.02

BELL 205, 212, 214, 412

EXTRA LARGE CARGO BASKET INSTALLATION

BASKET LOAD TESTS

Prepared by: Jeff Clarke, P.Tech.(Eng.)

Revision 0, 05 December 2014

JT = James Tinson, DAA 304
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A Dec 2014
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1.0 INTRODUCTION

This report documents the load tests used to demonstrate compliance with the structural requirements of the basis of certification.

2.0 REFERENCE TEXT

Engineering Report ER1006.01, Revision 0, 14 September 2014, Quick Release Mega Cargo Basket – Compliance report

-Loads, section 4.0

Aero Design Ltd. Installation Drawings:

100602, Revision 0 – Cargo Basket Installation – Extended Lid

100605, Revision 0 – Mounting Provisions Installation (Low Mount)

Aero Design Ltd. Fabrication Drawings:

100610, Revision 0 – Cargo Basket Assembly

100611, Revision 0 – Basket Body Assembly

100613, Revision 0 – Extended Lid Assembly

100630, Revision 0 – Forward Mounting Beam Fabrication (Low Mount)

100630, Revision 0, Chg. B – Forward Mounting Beam Fabrication (Low Mount)

100631, Revision 0 – Aft Mounting Beam Fabrication (Low Mount)

100631, Revision 0, Chg. B – Aft Mounting Beam Fabrication (Low Mount)

100635, Revision 0 - Struts

3.0 LOADS

The loads are determined in Engineering Report ER1006.01, Revision 0. The summarized loads are below.

3.1 Combined Positive Maneuvering and Drag Load

$P_{lim_man} = 1838 \text{ lbs} - 97 \text{ lbs}$	(basket applies 1g down - 97 lbs)
$P_{lim_man} = 1741 \text{ lbs}$	Limit positive maneuvering load due to basket and cargo
$P_{lim_drag} = 512 \text{ lbs}$	Limit drag load
$P_{ult_man} = 2756 \text{ lbs} - 97 \text{ lbs}$	(basket applies 1g down - 97 lbs)
$P_{ult_man} = 2659 \text{ lbs}$	Ult. positive maneuvering load due to basket and cargo
$P_{ult_drag} = 768 \text{ lbs}$	Ultimate drag load

3.2 Negative Maneuvering Load

$P_{lim_cargo_neg} = -400 \text{ lbs}$	Limit negative maneuvering load due to cargo
$P_{ult_cargo_neg} = -600 \text{ lbs}$	Ultimate negative maneuvering load due to cargo

3.3 Sideward Emergency Landing Load

$P_{ult_side} = 10 \text{ lbs}$	Ultimate sideward load on handle assembly
----------------------------------	---

4.0 TEST SETUP

4.1 Test Article

The tests will be performed using the following:

100610-02 - Cargo Basket Assembly with Extended Lid

100630-01-01 - LH Low Forward Beam Assembly

100631-01-01 - LH Low Aft Beam Assembly

100635-01, 100635-02, 100635-03 - Forward and Aft Strut Assembly and Drag Link

Form AN B043 conformity inspection record will be completed by Aero Design Ltd. The basket will be available for inspection by Transport Canada.

4.2 Test Fixture

The tests are performed on a fixture that simulates the hardpoints on the left side of the helicopter. The fixture consists of a large I beam, W16 x 50 structural steel, with lugs located in the same position as on the helicopter.

The cargo basket mounting provisions are installed on the fixture in accordance with drawing 100605. The cargo basket is installed on the mounting provisions in accordance with drawing 100601.

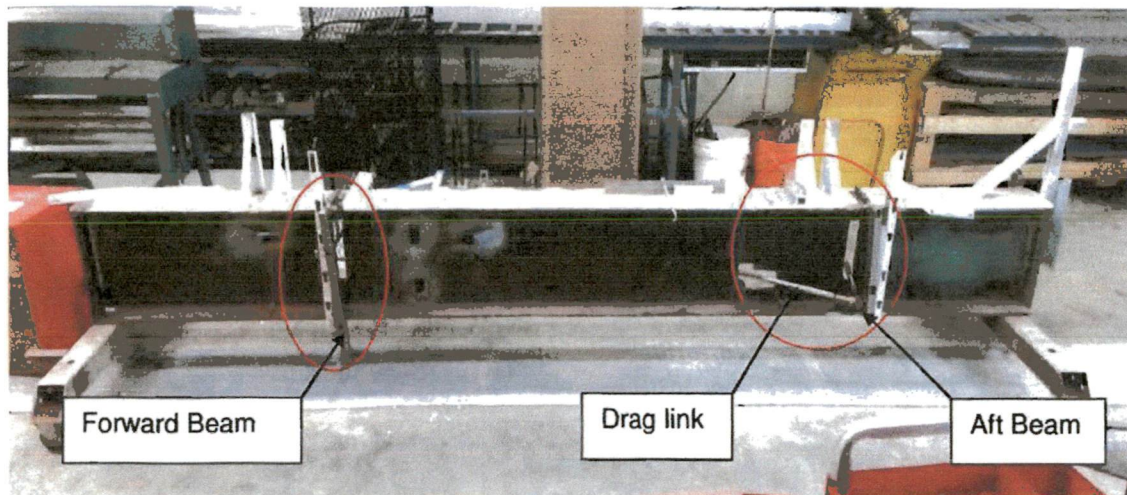


Figure 4.1.1 – Test Fixture – Side view

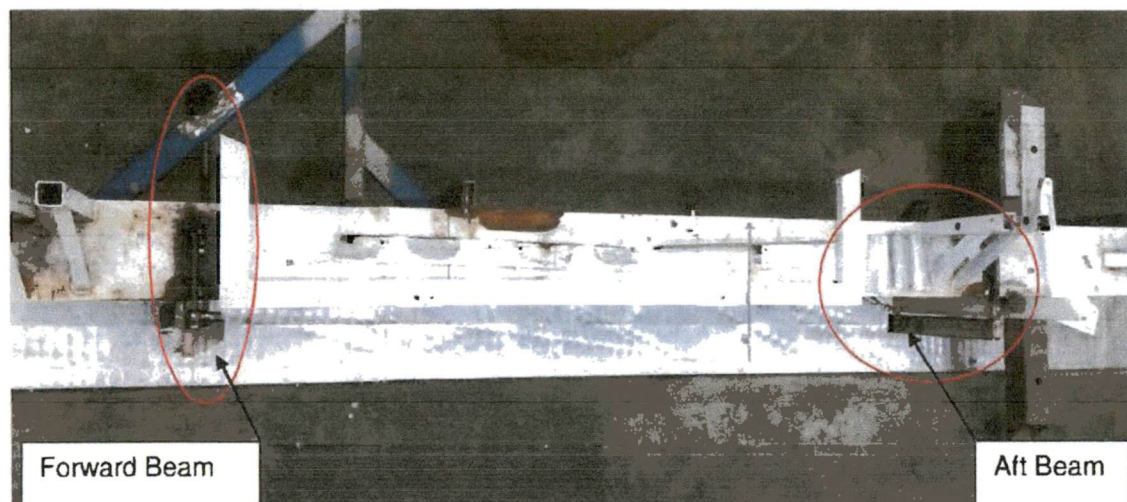


Figure 4.1.2 – Test Fixture – Top View

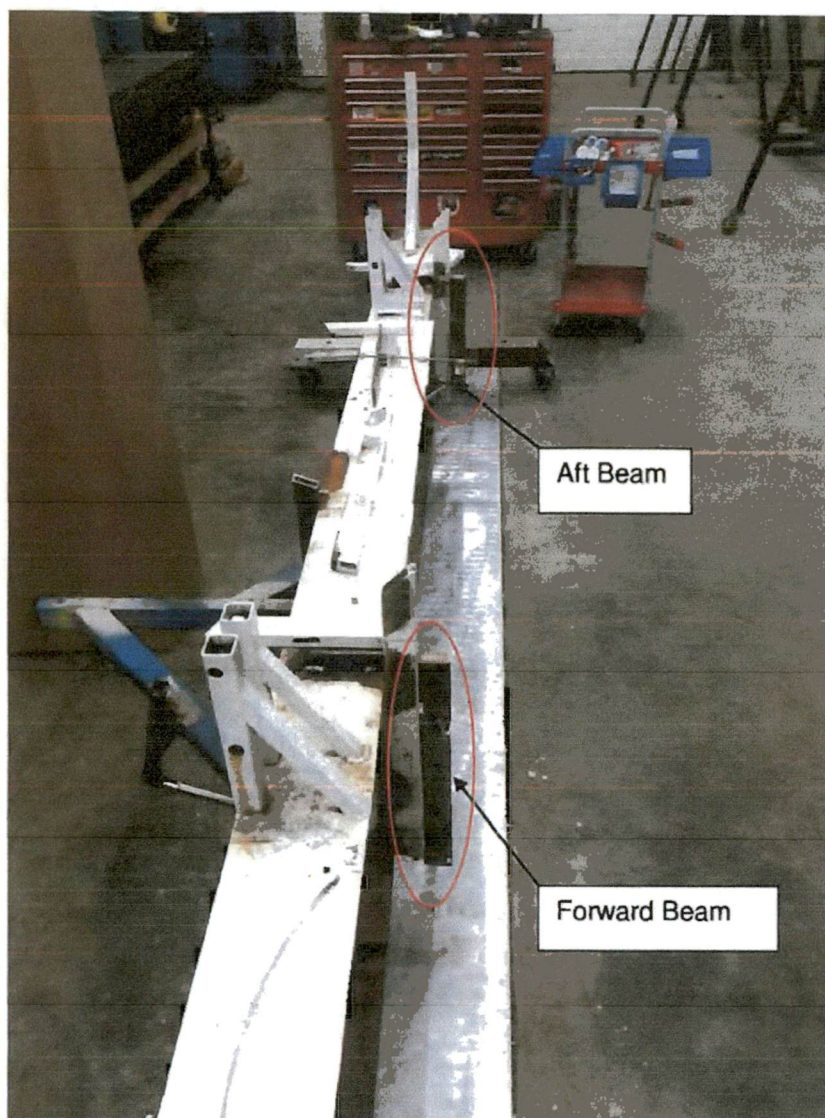


Figure 4.1.3 – Test Fixture – End View



Figure 4.1.4 – Forward (left) and Aft (right) beams

To simulate drag, a fixture is installed on the aft end of the basket to pull directly on the last hoop.

4.3 Procedure

4.3.1 Combined Positive Maneuvering and Drag Load

1. Install the basket on the mounting beams. Open the lid. Attach drag fixture to aft hoop.
2. Apply the limit maneuvering load (1746 lbs) downward using bags of lead shot, 25 lbs each, evenly distributed over the bottom of the basket. 70 bags are required (1750 lbs).
3. Close the lid and latch the handle. Ensure correct functioning of handle latching.
4. Pull limit drag load (512 lbs) aft on eye bolt from step 2 using a load cell and chain come-along.
5. The load must be applied for at least 3 seconds.
6. Document the test with pictures of the bags of lead shot stacked in the basket and of the overall test.
7. CAREFULLY release the drag load.
8. CAREFULLY open the lid. Keep feet clear of basket. Remove the load from the basket. Remove the basket from the mounting beams.
9. Visually inspect the basket, lid, hinge, handle and brackets, and mounting beams for signs of permanent deformation. Ensure correct functioning of handle latching.
10. Install the basket on the mounting beams. Open the lid. Attach drag fixture to aft hoop.
11. Apply the ultimate load (2659 lbs) downward using bags of lead shot, 25 lbs each, evenly distributed over the surface of the lid. 106 bags are required (2650 lbs), or additional confirmed weights totaling at least 2659 lbs.
CAUTION: KEEP FEET CLEAR FROM UNDER BASKET.
12. Close the lid and latch the handle.
13. Pull ultimate drag load (768 lbs) aft on eye bolt using a load cell and chain come-along.
14. The load must be applied for at least 3 seconds.
15. Document the test with pictures of the bags of lead shot stacked on the lid and of the overall test.
16. CAREFULLY release the drag load.
17. CAREFULLY open the lid. Keep feet clear of basket. Remove the load from the basket. Remove the basket from the mounting beams.
18. Visually inspect the basket, lid, hinge, handle and brackets, and mounting beams for signs of permanent deformation or failure. Ensure correct functioning of handle latching.
19. Record the results in section 5.1 below.

4.3.2 Negative Maneuvering Load

1. Install the basket upside down on the mounting beams. Open the lid, supporting the lower edge to prevent pulling on the prop.
2. Apply the limit load (400 lbs) downward using bags of lead shot, 25 lbs each, evenly distributed over the surface of the lid. 16 bags are required (400 lbs).
3. Close the basket and latch the handle.
4. The load must be applied for at least 3 seconds.
5. Document the test with pictures of the bags of lead shot stacked in the lid and of the overall test.

6. CAREFULLY open the lid, ensuring it is supported so it does not drop. Remove the load from the basket lid.
7. Visually inspect the lid, hinge, handle and brackets for permanent deformation. Ensure correct functioning of handle latching.
8. Apply the ultimate load (600 lbs) downward using bags of lead shot, 25 lbs each, evenly distributed over the surface of the lid. 24 bags are required (600 lbs).
9. Close the basket and latch the handle.
10. The load must be applied for at least 3 seconds.
11. Document the test with pictures of the bags of lead shot stacked in the lid and of the overall test.
12. CAREFULLY open the lid, ensuring it is supported so it does not drop. Remove the load from the basket lid. Remove the basket from the mounting beams.
13. Visually inspect the lid, hinge, handle and brackets for signs of permanent deformation. Ensure correct functioning of handle latching.
14. Record the results in section 5.2 below.

4.3.3 Sideward Emergency Landing Load Condition

1. Attach a second identical handle assembly to the handle installed on basket. Do not latch handle in brackets.
2. Set basket with handle down on blocks to allow the handle to hang.
3. Check that handle springs hold handle up to brackets. Handle must be able to engage secondary catch on handle brackets.
4. Latch handle in brackets
5. Attempt to open handle to ensure there is sufficient friction to hold the handle closed. Record load required to open handle in section 5.3 below

5.0 TEST RESULTS – 11 NOVEMBER 2014**5.1 Positive Maneuvering Load**

Tests witnessed by TCCA DAR 304 James Tinson on 11 November 2014.

The positive maneuvering load tests were performed on basket assembly p/n 100610-02.

5.1.1 Limit Load

Condition	Required Load	Actual Load	Witness Initial
Limit Maneuvering Load (downward)	1729 lbs (distributed over bottom)	1750 lbs	<i>[Signature]</i> A Dec 2014
Limit Drag (aft)	512 lbs (pulled on aft hoop)	512 lbs	

After completing the limit load test, the basket was removed from the mounts and the basket and mounts were inspected for permanent or detrimental deformation. There was none found. The lid was opened and closed under load and the handle was checked for correct functioning, both performed normally, and were checked again after the load was removed, again performing normally.

5.1.2 Ultimate Load

Condition	Required Load	Actual Load	Witness Initial
Ultimate Maneuvering Load (downward)	2659 lbs (distributed over bottom)	2659 lbs	<i>[Signature]</i> A Dec 2014
Ultimate Drag (aft)	768 lbs (pulled on aft hoop)	(failure)	

The basket and mounts supported the ultimate positive maneuvering load for more than 3 seconds. The handle was checked for correct operation while under load.

The mounts failed during application of the drag load. The sequence of events, analysis of failure, and ramifications on proposed flight testing are discussed below.



Figure 5.1.3 – Ultimate Cargo Load



Figure 5.1.4 – Ultimate Cargo Load – lid closed, handle latched

5.2 Positive Maneuvering Load – Failure at Ultimate Load

5.2.1 Description of fixture

The following is a more detailed description of the test fixture than originally provided in section 4.2 to help illustrate how the fixture contributed to the failure of the basket mounts.

The fixture consists of a large I beam, W16x50 structural steel (7.07" wide x 16.2" tall, 50 lbs/foot), with 4" tubes welded across the bottom to provide stability. There are castors on the ends of the tubes to allow the I beam to be moved reasonably. Outriggers consisting of I beams on edge (essentially H beams) are bolted to the 4" tubes to provide additional support on the side of the I beam that is being loaded. The outriggers have adjustable pads on the far end to allow the fixture to be leveled if required. For this test, additional height is required to allow the basket to clear the floor. The entire fixture is set on large 8" x 12" wood blocks with notches in the top to prevent the castors from rolling.

The drag load could not be effectively applied to the basket with a sheet of plywood with an eye bolt in the centre as originally intended. The drag was instead applied by pulling aft on C-clamps attached to the inboard and outboard sides of the basket aft frame with a 2x4 spanning the face of the basket, and an additional 2x4 to prevent the C-clamps from twisting inward.

5.2.2 Sequence of events

Following the limit load test, the basket was installed on the fixture and loaded to the ultimate load (2659 lbs) using bags of lead shot, weights, and large pieces of scrap metal (C28 turbine and gearbox, cast iron engine intake manifold, HSS tubing sections, etc.). The basket and mounts were being checked during loading to ensure nothing contacted the fixture. As the last of the load was placed in the basket it was found the basket had contacted a castor on the aft end of the fixture.



Figure 5.2.1 – Ultimate Cargo Load – clearance from fixture and castor

To prevent the basket from contacting the castor, the castor needed to be rotated. The aft end of the fixture was jacked up by extending the foot pad while the basket was still loaded. As the foot pad was extended, a castor on the forward end failed, which caused the basket to drop about 1/2". The basket was allowed to stabilize and the mounts were checked for failure or contact with the I beam. Nothing was found to be out of place, and the basket was no longer in contact with the castor at the aft end. The outrigger was jacked until the castor was free of the notch in the wood block and was rotated away from the basket.

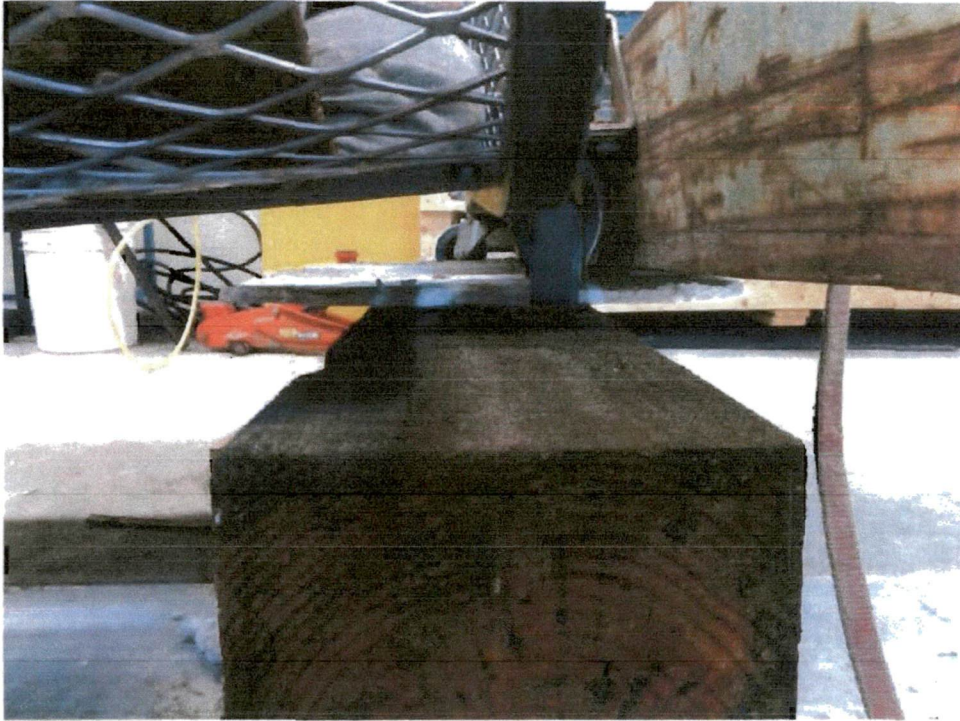


Figure 5.2.2 – Ultimate Cargo Load – Clearance from fixture and castor

At this point the basket was stable with the ultimate positive maneuvering load still in place in the basket. The drag load was attached with the C-clamp arrangement described above, and the load began to be applied. As the load increased to approximately 400 lbs the aft mount failed, bending the tube of the aft strut, and the threaded rods at the end of the strut and drag link. The deflection also twisted the bracket at the bottom of the beam and collapsed the wall of the tube about 1/8".

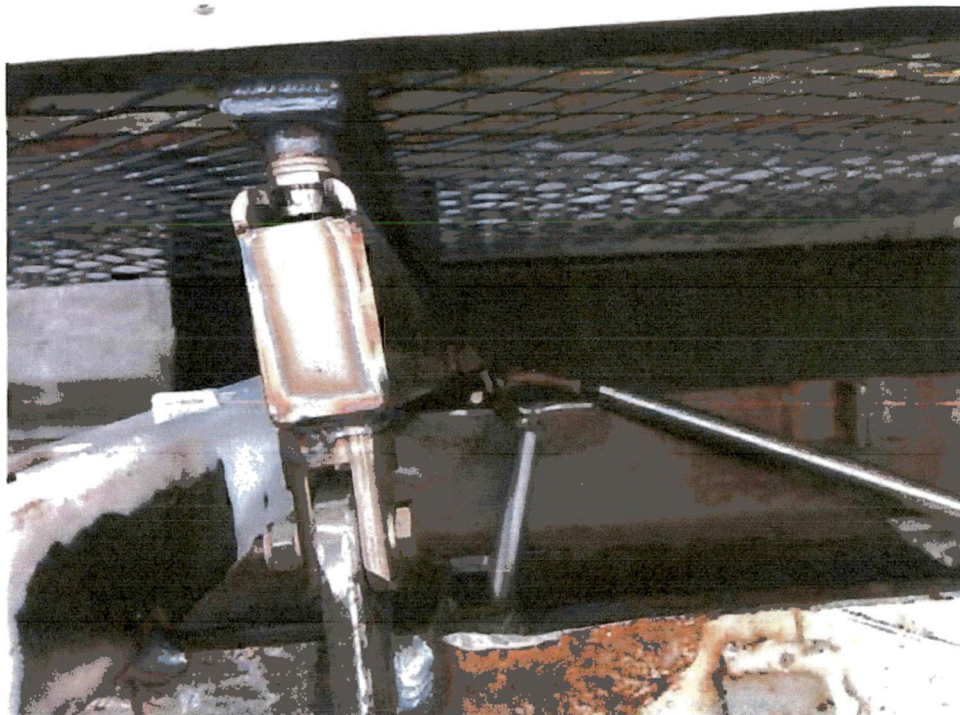


Figure 5.2.3 – Aft beam after failure (looking down)

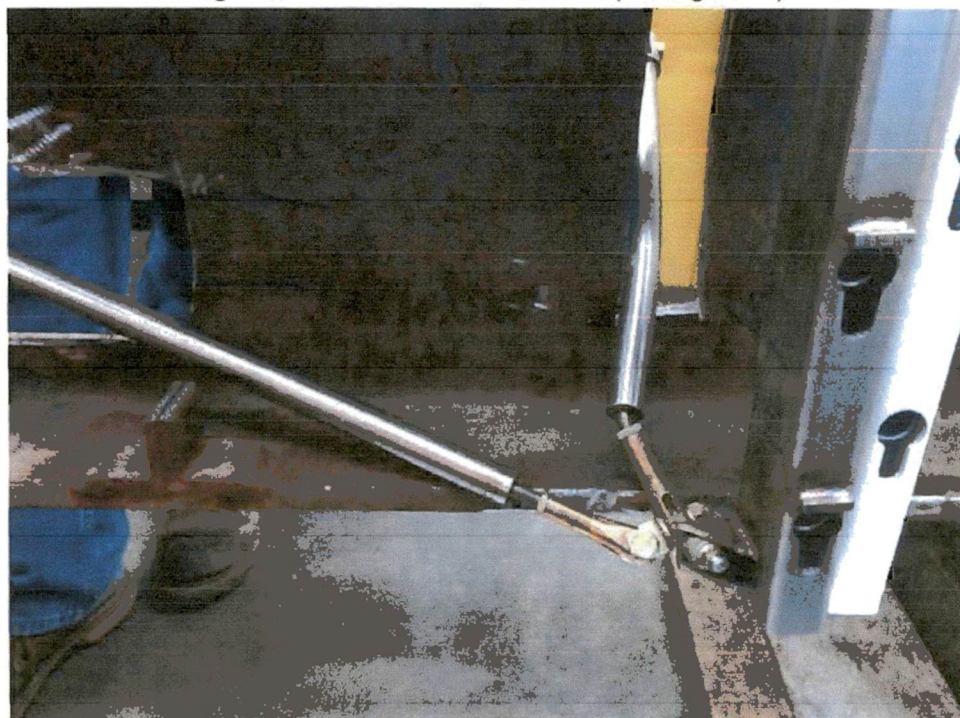


Figure 5.2.4 – Aft beam after failure (looking inboard)

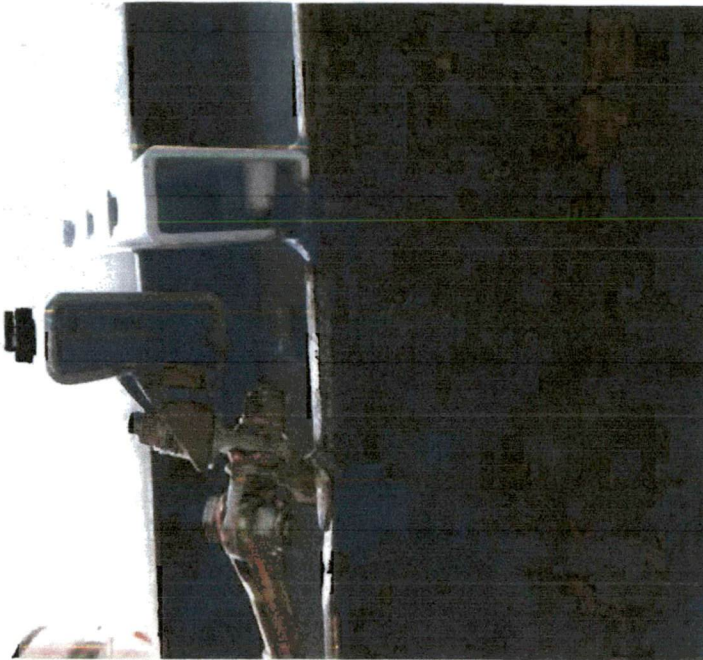


Figure 5.2.5 – Aft beam after failure (looking up)

5.2.3 Analysis of failure

The load was removed from the basket and the basket removed from the mounts. It was found that the aft strut and drag link were jammed against the bottom flange of the I beam after the failure. The outrigger was lowered, and the strut and drag link were freed and the clearance from the cutout in the web of the I beam for the strut increased. This indicates the I beam was twisted by raising the outrigger, which is supported by the fact that the forward outrigger was not also raised at the same time and remained in contact with the ground, and that I beams in general have relatively low torsional rigidity (compared to tubes).

The aft strut was contacted by the web of the I beam when the I beam was twisted, which was not noticed before application of the drag load. The contact caused the strut to have a bending load applied which could not be supported by the threaded rod at the end connection. The strut can only support axial loads, so once the threaded rod failed it twisted and pushed the eyebolt on the bracket at the bottom of the beam. Deflection of the bracket collapsed the wall of the tube and also bent the threaded rod on the drag link.

Based on the findings above, it is expected the mounts would not have failed had the outrigger not been raised. As such, the test will be performed again using new mounting beams, struts and drag link.

5.2.4 Ramifications of Failure

This load test was performed shortly before certification flight tests. Since the ultimate load was not achieved, the allowable loads must be reduced. The limit loads achieved will now be considered the ultimate loads with the cargo load and V_D reduced accordingly for the flight tests. The limits specified on SI 521-004 Appendix F completed by James Tinson, 11 Nov 2014:

Maximum Cargo Load: 267 lbs

Maximum V_D : 127 KIAS

Beams modified to cap bottom end with 1/8" thick cap with 1/4" drain hole in center.

New beams were fabricated with the cap, and also the eyebolt bracket flanges were extended.

6.0 TEST RESULTS – 04 DECEMBER 2014

6.1 Positive Maneuvering Load

Tests witnessed by TCCA DAR 304 James Tinson on 04 December 2014.

The positive maneuvering load tests were continued using the same basket assembly 100610-02, with the lid removed to facilitate loading. The mounting beams were modified as indicated in section 5.2.4 to include heavy caps on the bottom and extended flanges on the brackets, as shown on drawings 100630 Rev. 0 Chg. B and 100631 Rev. 0 Chg. B.

6.1.1 Ultimate Load

Condition	Required Load	Actual Load	Witness Initial
Ultimate Maneuvering Load (downward)	2659 lbs (distributed over bottom)	2712 lbs	<i>[Signature]</i> 4 Dec 2014
Ultimate Drag (aft)	768 lbs (pulled on end hoop)	784 lbs	

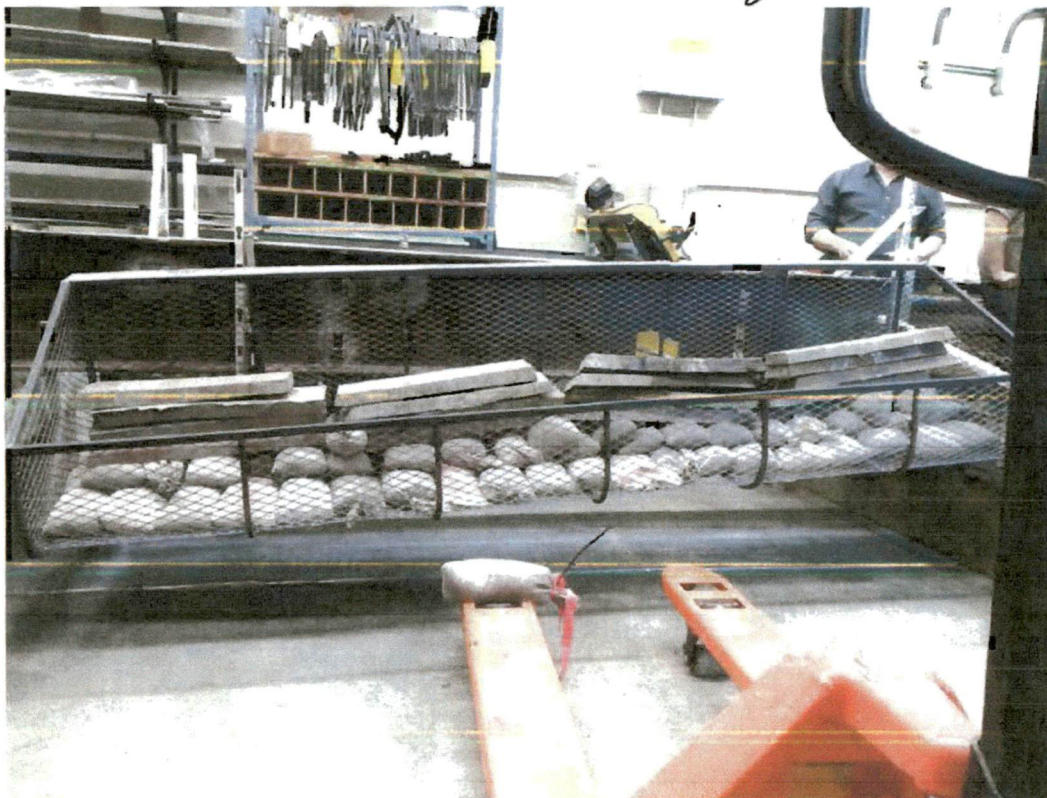


Figure 6.1.1 – Ultimate Positive Maneuvering Load (looking inboard)

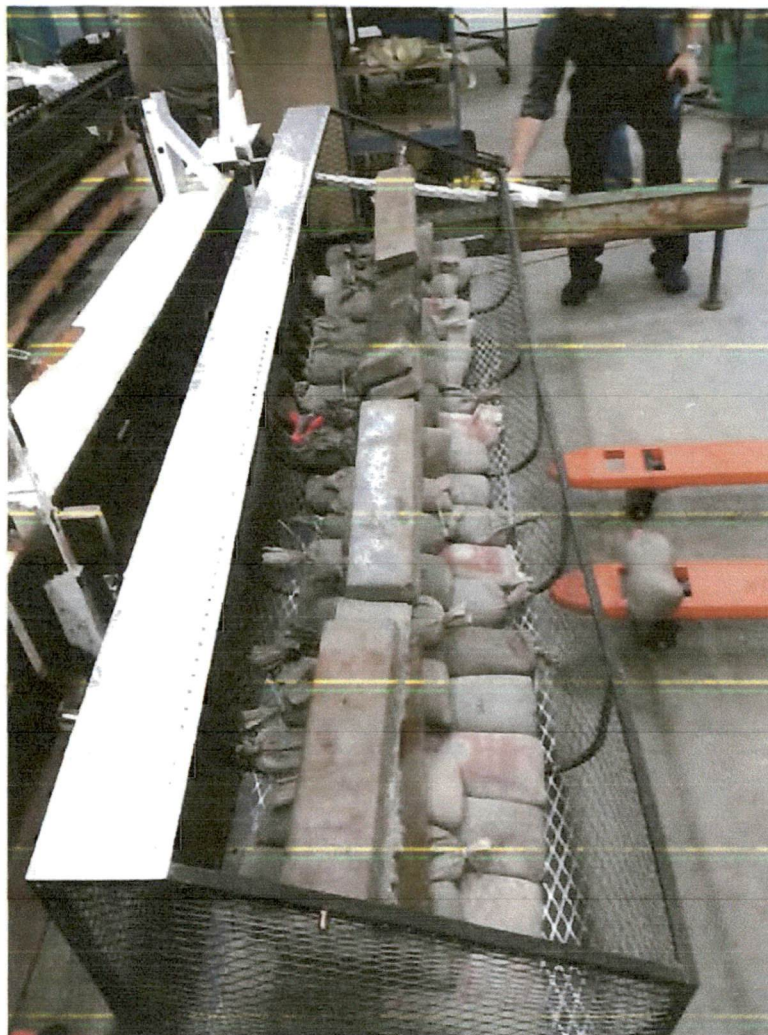


Figure 6.1.2 – Ultimate Positive Maneuvering Load (looking down)

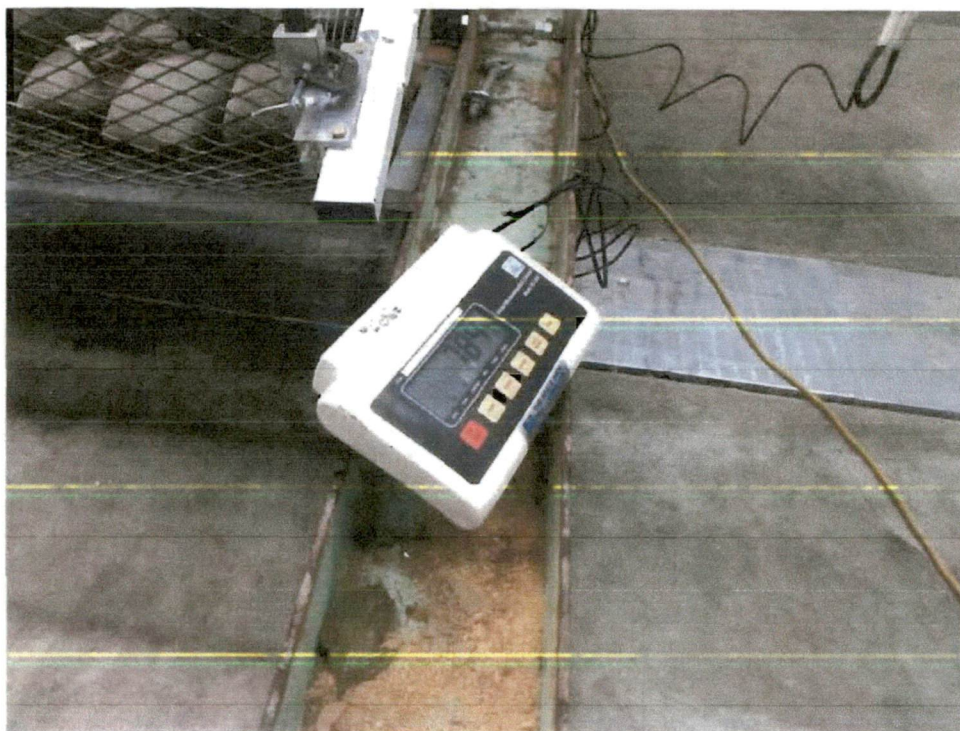


Figure 6.1.3 - Ultimate Drag Load

The loads were applied in combination for greater than 3 seconds.

The basket and mounts were measured for deflections before and after the test while on the fixture. There was no permanent deformation found following application of the ultimate loads.

The basket and mounts were inspected following the test. There was minor local deformation on the edge of the head of the upper basket mounting lugs (96710-01). There was minor deflection of the mounting pads welded to the forward beam, outward on the top (tension side), inward on the bottom (compression side), both less than 1/32". The deformations did not prevent removal of the basket from the mounting beams. There was no deformation found on the aft mounting beam, the struts or drag link.

6.2 Negative Maneuvering Load

The negative maneuvering load was tested on basket P/N 100610-01. The flat lid is more critical than the extended lid as it has less rigidity.

6.2.1 Limit Load

Condition	Required Load	Actual Load	Witness/Initial
Limit Maneuvering Load (upward)	400 lbs (distributed)	400 lbs	<i>[Signature]</i> 4 Dec 2014

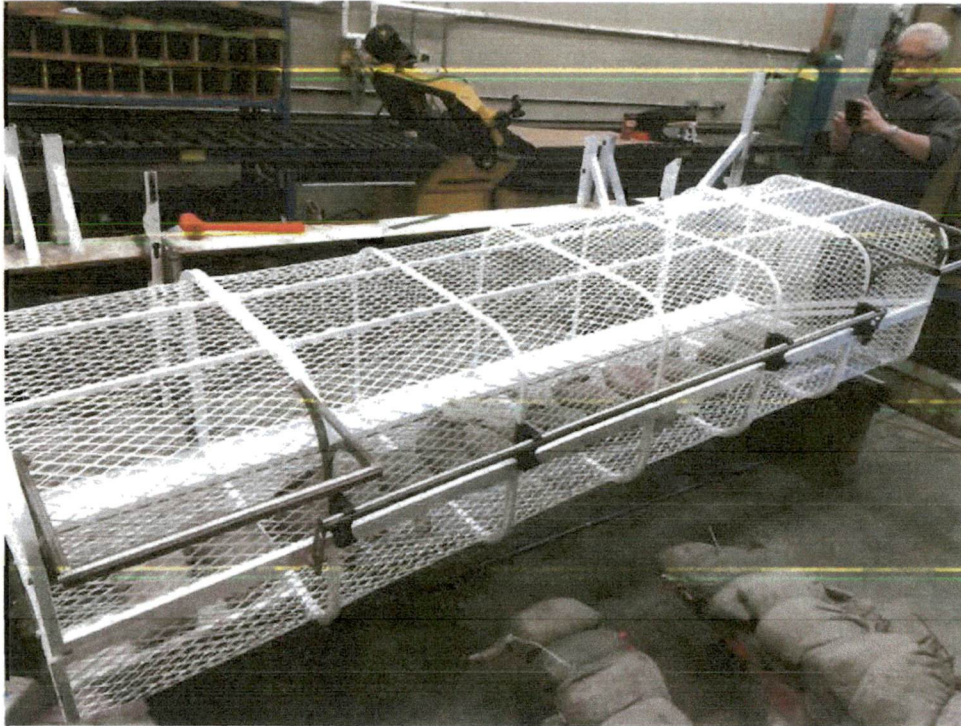


Figure 6.2.1 – Limit Negative Maneuvering Load

The load was applied for more than 3 seconds. The load was not removed to check for deformations as previous experience has demonstrated the lid and handle system are capable of supporting loads of this magnitude without deformation. Testing continued to ultimate.

6.2.2 Ultimate Load

Condition	Required Load	Actual Load	Witness Initial
Ultimate Maneuvering Load (upward)	600 lbs (distributed)	600 lbs	<i>[Signature]</i>

*4 Dec
2014*



Figure 6.2.2 – Ultimate Negative Maneuvering Load

The load was applied for more than 3 seconds. The handle, brackets, and lid were inspected after the load was removed. There was no permanent deformation found. The handle functioned correctly after removal of the load.

6.3 Emergency Landing Side Load

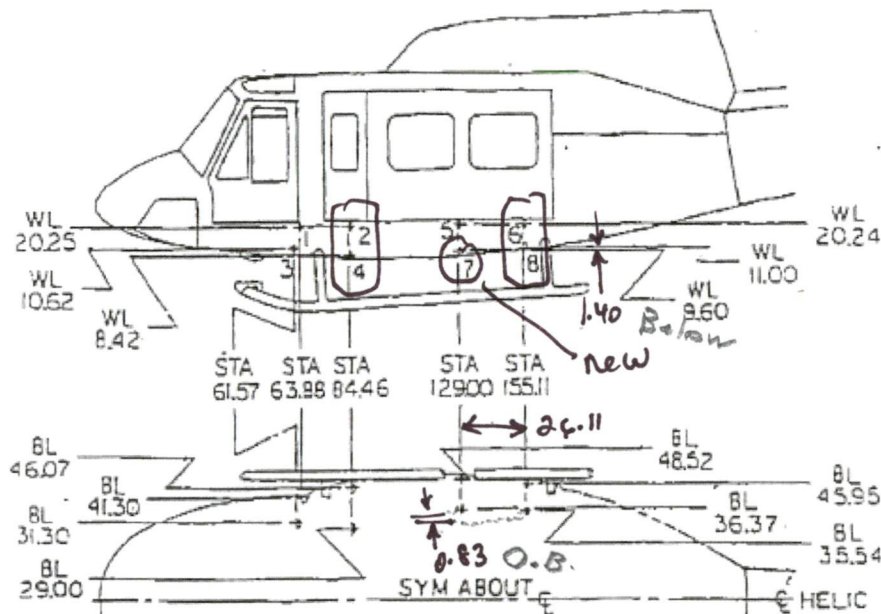
6.3.1 Ultimate Load

Condition	Required Load	Actual Load	Witness Initial
Ultimate Load (side)	2g (~10 lbs)	Pull >20 lbs	<i>JL</i> + Dec 2014

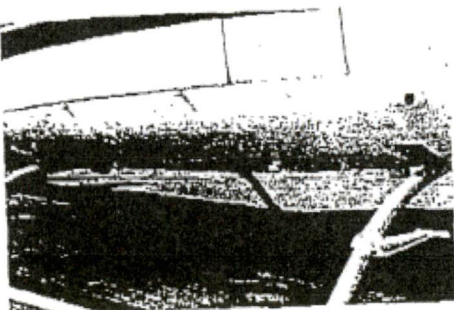
The handle requires significantly more than 10 lbs to disengage from the handle brackets. The handle springs hold the handle in to the basket at 1g, which allows the handle to engage the secondary catch. Stiffer springs will be used in the final assembly.

EXTERNAL HARDPOINTS: MODELS 205, 212, 214B & 412

FUSELAGE LOCATIONS AND ALLOWABLE ULTIMATE LOADS

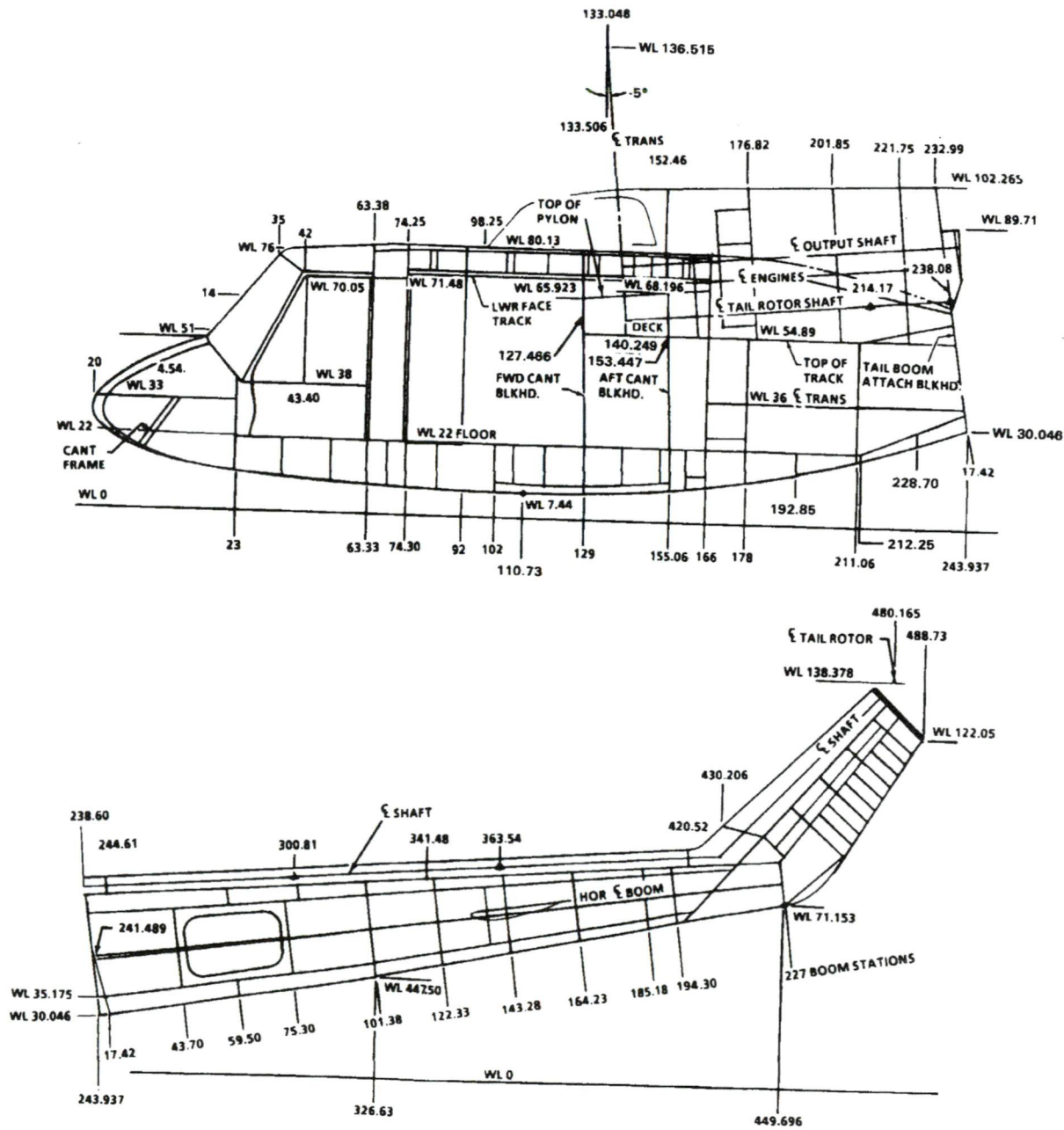


CAUTION: Helicopter C.G. limits must be maintained for all equipment or stores configurations which attach to any or all of these hard-points.



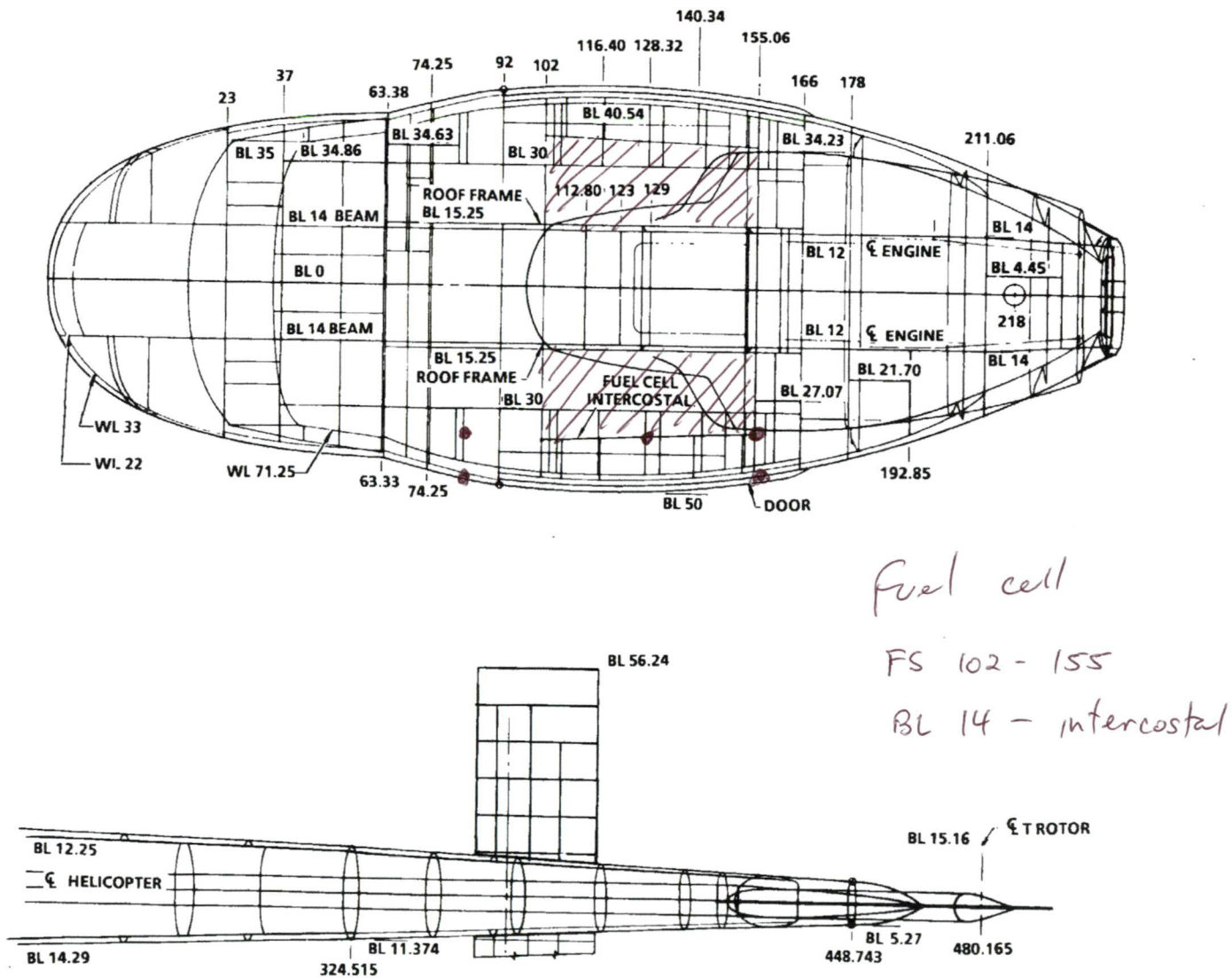
Provisions to attach special equipment externally on the lower fuselage are provided as part of the basic airframe. Nine hard point fittings are mounted on each side. The most forward hard point is part of the jacking/mooring point. Four fittings make up the forward cluster and four make up the aft cluster.

Each cluster is designed to carry a load of 340 kilograms, 750 pounds, with the center of gravity between the pairs and about 38 centimeters, 15 inches outboard of the widest part of the fuselage.



212-M-6-2-2

Figure 6-2. Station diagram (sheet 2)



212-M-6-2-1

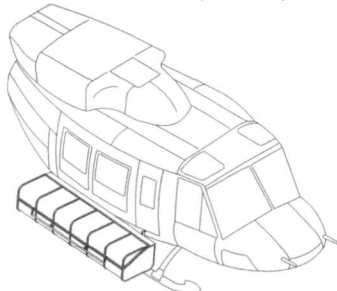
Figure 6-2. Station diagram (sheet 1 of 2)

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 751.90

BELL 205, 212, 214, 412 SERIES

QUICK RELEASE CARGO BASKETS

MODELS: 751, 955, 1006



TCCA Supplemental Type Certificate No. SH07-56
FAA Supplemental Type Certificate No. SR02730NY
EASA Supplemental Type Certificate No. _____

Preface

These Instructions for Continued Airworthiness shall be included in the rotorcraft Maintenance Manual when the Quick Release Cargo Basket installed in accordance with Aero Design Ltd. Document Control Lists:

DCL751-1, Revision 2 (for basket and mounting provisions model 751)
DCL955-3, Revision 0 (for basket model 955)
DCL1006-1, Revision 0 (for basket model 1006)
DCL1006-2, Revision 0 (for mounting provisions model 1006)
or later approved revision, is installed.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 2
Date: 16 December, 2014

Aero Design Ltd.



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RECORD OF REVISIONS

Revision Number	Issue Date	Date Inserted	By
0	6 September 2007		Original Issue
1	18 November 2008		
2	16 December 2014		

LIST OF EFFECTIVE PAGES

List of Revisions	Revision 0 (Original Issue)	6 September, 2007
	Revision 1	18 November, 2008
	Revision 2	16 December 2014

List of Effective Pages

<u>Description</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	2
Revision Record/List of Effective Pages	2	2
Table of Contents	3	2
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04-00-00	7	2
05-00-00	8-11	2
11-00-00	12	2
25-50-00	13-28	2

NOTE

Revised text is indicated by a black vertical line. A revised page with only a vertical line next to the page number indicates that text has shifted or that non-technical correction(s) were made on that page. Insert latest revision pages; dispose of superseded pages.

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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 29.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Quick Release Cargo Basket as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness

LH - Left Hand

RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Quick Release Cargo Basket. Requests for a copy may be made in writing to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

High skid landing gear installation is a mandatory prerequisite for installation of Quick Release Mounting Provisions in accordance with drawing 75102.

High skid landing gear installation is a mandatory prerequisite for installation of the Low Mounted Quick Release Mega Cargo Basket in accordance with drawing 100601 and 100602.

0-5 GENERAL DESCRIPTION

The cargo basket installation is a metal mesh basket installed to the side of the helicopter on beams attached to existing hard points under the main cabin door. The quick release mechanism allows for the installation and removal of the basket quickly without tools, leaving the mounting beams in place.

There are 3 different models of basket. The inside dimensions are as follows:

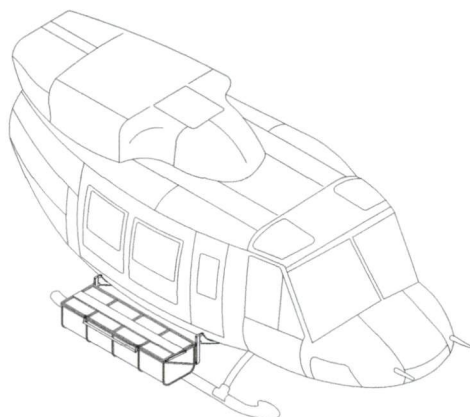
Model 751 basket: 71.5" long, 21" wide, 15.8" high.

Model 955 basket: 89.3" long, 24.3" wide, 17" deep

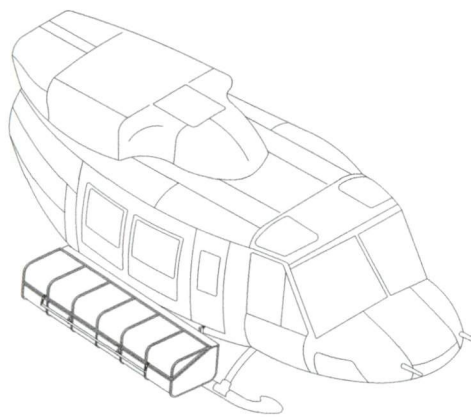
Model 1006 basket, with standard lid: 108.8" long, 29" wide, 21.1" deep

Model 1006 basket, with extended lid: 108.8" long, 29" wide, 27.1" deep

The baskets are made of a steel welded tubing structure, and lined with expanded steel mesh. The basket has a hinged lid with a locking handle and automatic safety catch.



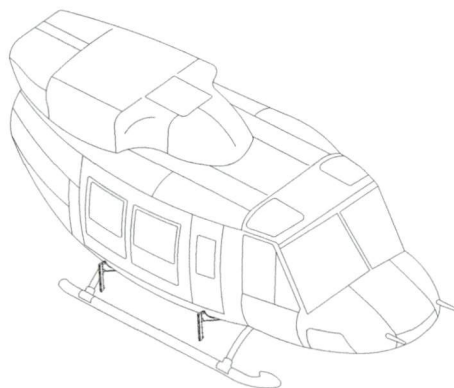
Model 751



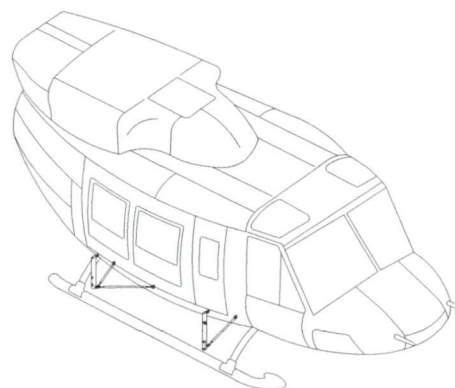
Model 1006

Figure 0.1 – Cargo Basket Installation

There are two configurations of mounting provisions. The 751 configuration consists of a machined aluminum beam to attach to the existing fuselage hard points, with a stainless steel down-tube bolted to the outboard face. The quick release mechanism is built into the down-tube on both forward and aft beams.



Model 751



Model 1006

Figure 0.2 – Mounting Provisions Installation

The 1006 configuration of mounting provisions uses stainless steel tubing beams with struts and a drag link to attach to the fuselage hard points, and is available in either high and low configuration. The mounts use horizontal keyways on the forward beam and vertical keyways with the quick release mechanism on the aft beams. This arrangement simplifies installation over the 751 configuration by allowing the basket to be positioned fore and aft to align with the vertical keyways, and simplifies removal as only 1 pin must be released to remove the basket.

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

The Airworthiness Limitations section is FAA approved and specifies maintenance required under Sections 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

EASA

The Airworthiness Limitations section is approved and variations must also be approved.

No additional airworthiness limitations have been imposed due the installation of the Quick Release Cargo Basket.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Continued airworthiness is contingent upon compliance with the following inspection items. These items shall be completed in conjunction with the rotorcraft Maintenance Inspection schedule, or other approved program, or upon removal and replacement of any component of Quick Release Cargo Basket.

Daily Inspection

1. Inspection Area: Basket

- a) Inspect the basket attachment to the beams for condition and security. Ensure quick release mechanism is completely extended, flush with the outboard surface of the beam. If pin does not completely extend, or spring tension is not sufficient to retain basket, replace spring, refer to section 25-12.
- b) Model 751 Basket, up to S/N 75101-13: Inspect latching of the lid for correct operation. If basket is bent inward the lid will close but may not latch.
- c) All baskets except Model 751 up to S/N 75101-13: Inspect latching of the lid for correct operation. Replace handle brackets on basket if handle is not retained in latched position. Refer to section 25-9.

300 Hour or Annual Inspection

1. Inspection Area: Basket

- a) Visually inspect tube-to-tube welds and mesh-to-tube welds for cracks, corrosion or other damage.
- b) Visually inspect basket mesh for damage.
- c) Visually inspect lid prop for condition and operation. Ensure prop does not extend beyond catch and catch extends to hold lid open. Refer to section 25-11 for lid prop replacement.
- d) Visually inspect handle for condition and operation. Ensure springs on lid brackets hold handle in to guide handle to engage catch (Model 751 up to S/N 75101-13) or secondary catch (all other baskets) on handle brackets. Refer to section 25-10 for handle spring replacement.

2. Inspection Area: Beams

With the basket removed:

- a) Visually inspect aluminum beams (75102 Configuration only), down-tubes, struts, and drag link, as applicable, attaching basket to the helicopter for cracks, corrosion or other damage.
- b) 75102 Configuration only: Visually inspect the AN5 bolts attaching the stainless steel tube to the aluminum beam for condition and security.
- c) Visually inspect lugs attaching the basket to the beams for security and damage.

- d) Visually inspect fasteners attaching beams, struts, and drag link, as applicable, to helicopter hard points for condition and security.

Special Inspections

Following a hard landing inspect the Quick Release Cargo Basket installation in accordance with the 300 hour or annual inspection listed above.

5-2 DAMAGE LIMITS / REPAIR INSTRUCTIONS

If damage is found in the inspections above, repair in accordance with the instructions below.

1. Basket and Lid Tubing

Damage Limits:

- a) Deformation of any tubing between welded joints not exceeding 0.25 inches in any direction must be repaired in accordance with the instructions below.
- b) Corrosion not exceeding 0.015 inches deep to be buffed out to a smooth contour.
- c) Corrosion exceeding 0.015 inches deep to be repaired in accordance with the instructions below.

Repair Instructions:

- a) Repair Basket in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, as required.
- b) Basket is fabricated from the following materials:
 - Attachment Hoops: 1" square steel tube and/or 1/2" square steel tube
 - Lid and Rim: 3/4" square steel tube
 - Frames: 1/2" square steel tube
- c) Touch up with polyurethane paint as required following repairs.

2. Basket and Lid Mesh

Damage Limits:

- a) The basket mesh may be deformed or stretched without limit, so long as the welds attaching the mesh to the basket or lid are not compromised. If welds are compromised, repair in accordance with instructions below.
- b) Tears in the mesh not exceeding 4 cells in any direction may be repaired by patching. Maximum one repair patch per bay. See instructions below.

Repair Instructions:

- a) Repair mesh to tube welds in accordance with AC43.13-1B, Chapter 4, Section 5, Welding, as required.
 - Mesh: 3/4" 16 ga. (0.040") expanded steel mesh

b) Patch repair:

- a. Cut two aluminum sheets, minimum 0.040 inches thick, extending to at least 1 complete cell outside of torn area. Drill #9 holes in the corners of the sheet, located to clear the mesh when installed.
- b. Attach patches, one inside and one outside, to the mesh with AN3 Bolts, AN970-3 Washers, and MS21044N3 Nuts.

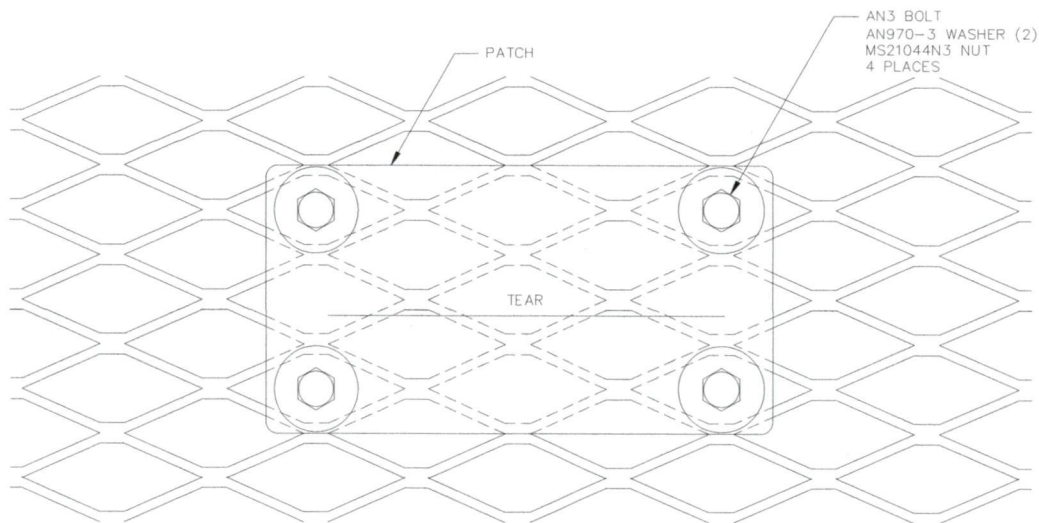


Figure 5.1 – Patch Repair

- c) Touch up with polyurethane paint as required following repairs.

3. Steel Beams

DO NOT REPAIR DAMAGE TO BEAMS IF BEYOND THE LIMITS BELOW.

- a) Nicks and/or gouges on the outboard face up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- b) Nicks and/or gouges on the side and inboard faces up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- c) 75102 Configuration only: Critical keyway dimensions are shown in Figure 5.2. Attempt to insert 27/64 drill shank into bottom end of keyway. If drill can be inserted, slot is worn beyond limit.

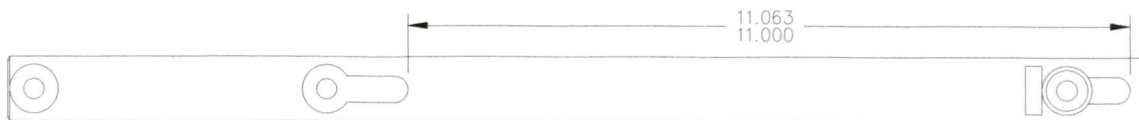


Figure 5.2 – Keyway dimensions (75102 Configuration)

- d) 100605 and 100606 Configurations only: Critical keyway dimensions are shown in Figure 5.3. Attempt to insert 15/32 drill shank into bottom of keyways. If drill can be inserted slot is worn beyond limit.

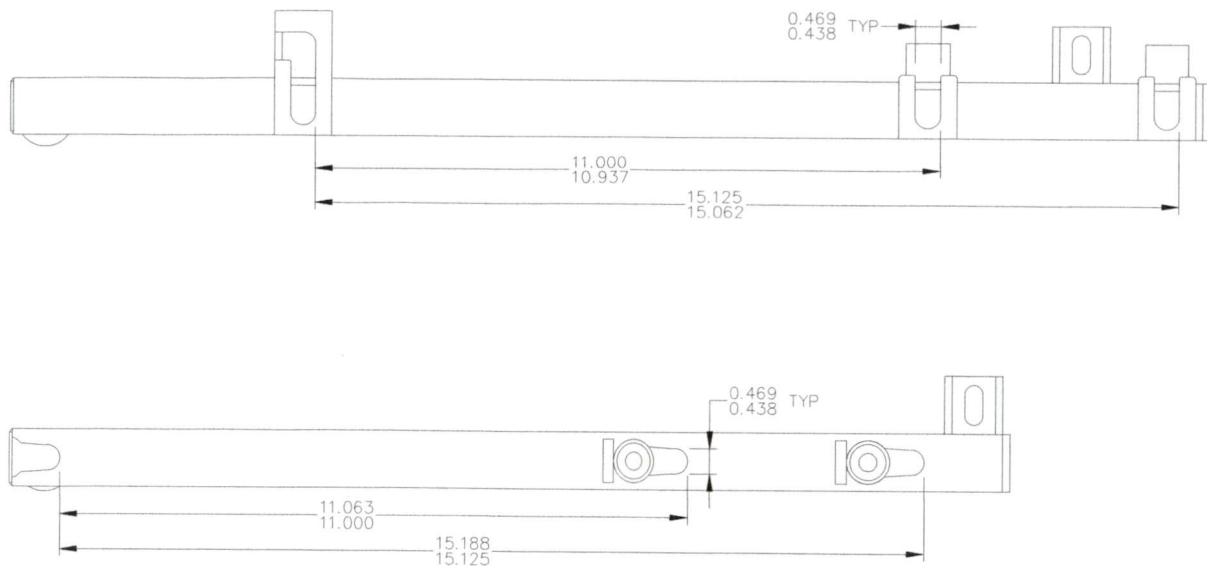


Figure 5.3 – Keyway dimensions
(100605 Configuration shown, 100606 Configuration dimensions same)

e) Touch up with polyurethane paint as required following repairs.

3. Aluminum Beams (75102 Configuration only)

DO NOT REPAIR DAMAGE TO BEAMS IF BEYOND THE LIMITS BELOW.

- Nicks and/or gouges on the top or bottom face up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- Nicks and/or gouges on the flanges up to 0.060" deep and 0.125" wide may be dressed out to a smooth contour.
- Nicks and/or gouges on the web up to 0.030" deep and 0.125" wide may be dressed out to a smooth contour.
- Touch up with polyurethane paint as required following repairs.

5-3 PROTECTIVE TREATMENT INFORMATION

1. Beams

The steel tube is supplied powder coated or painted. The aluminum beam (75102 configuration) is supplied painted. If the powder coat or paint is damaged, touch up with polyurethane paint.

2. Cargo Basket

The cargo basket is supplied powder coated. If the powder coat is damaged, touch up with polyurethane paint.

CHAPTER 11 – MARKINGS AND PLACARDS

The following markings and placards are used with the Quick Release Cargo Basket Installation, located on the basket lid:

a) Basket Model 751:**Basket S/N 75101-01 thru 75101-13****Basket S/N 75101-14 and Sub.****b) Basket Model 955:****Basket S/N 95501-01 and 95501-02****Basket S/N 95501-03 and Sub.****c) Basket Model 1006, with standard lid:****d) Basket Model 1006, with extended lid:**

CHAPTER 25 – EQUIPMENT AND FURNISHINGS

SECTION 50 – CARGO COMPARTMENTS

The Quick Release Cargo Basket Installation may be applied to the right or left side of the helicopter. The Beams may be installed on both the right and left sides. A Cargo Basket may only be installed on the right or left side, not both.

25-1 ATTACHMENT PROVISIONS REMOVAL (75102 CONFIGURATION)

Refer to Figure 25.1.

1. Remove Cargo Basket. Refer to section 25-4.
2. Remove two AN5-12A Bolts, NAS1149F0563P Washers and MS21044N5 Nuts from 75115-01 Forward Beam Assembly. Remove Forward Beam.
3. Remove two AN4-12A Bolts, NAS1149F0463P Washers and MS21044N4 Nuts from 75116-01 Aft Beam Assembly. Remove Aft Beam.

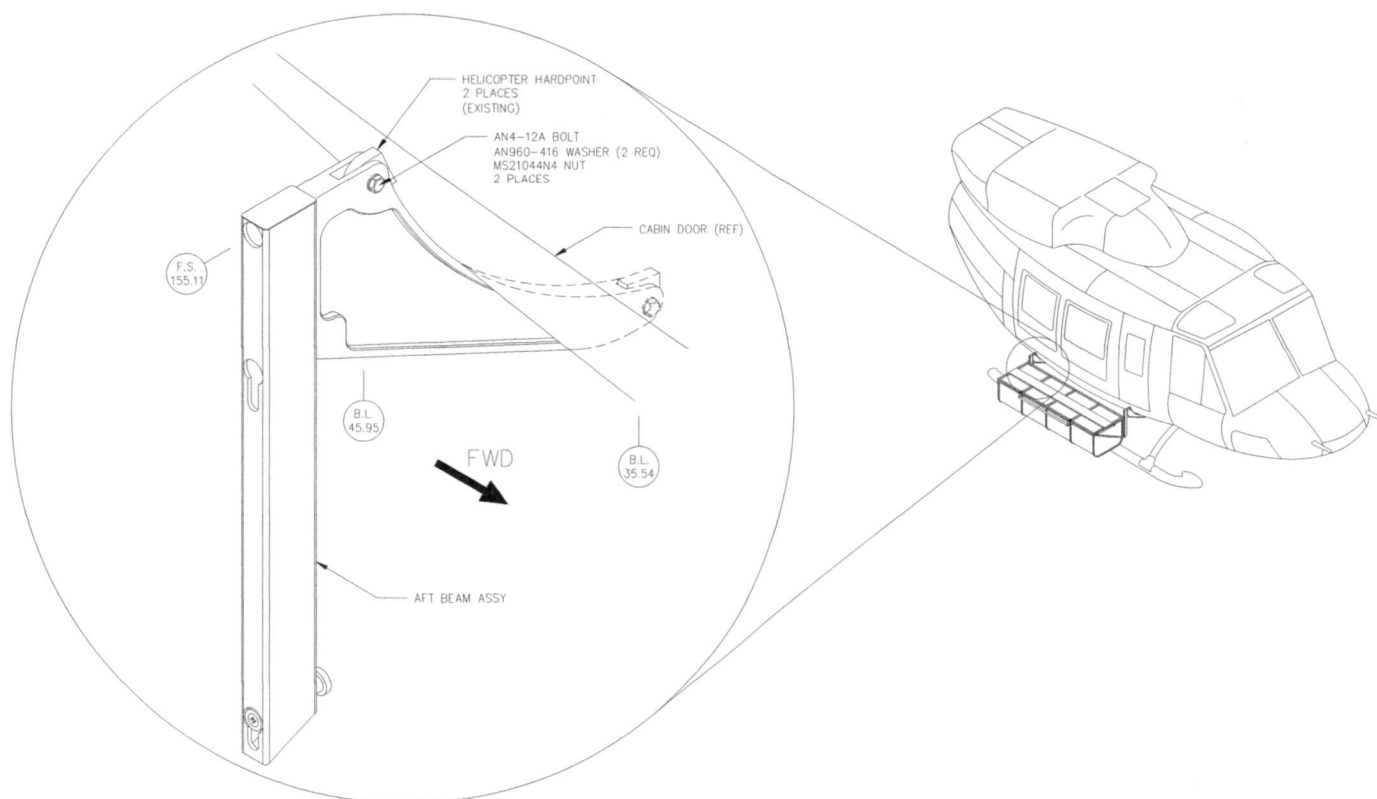


Figure 25.1 – Attachment Provisions Installation (75102 Configuration)
(Right side shown, left side similar)

25-2 ATTACHMENT PROVISIONS INSTALLATION (75102 CONFIGURATION)

Refer to Figure 25.1.

1. Ensure hard points at FS 84.46 and FS155.11 are fitted with bushings, in accordance with the original configuration of the helicopter. Bushings must be pressed flush with the surface of the lug.

2. Locate 75115-01 Forward Beam Assembly on hard points at FS 84.45. Install two AN5-12A Bolts, NAS1149F0563P Washers (2 per bolt) and MS21044N5 nuts. Torque AN5 bolts to 100-140 in-lbs (11.3-15.8 N-m).
3. Locate 75116-01 Aft Beam Assembly on hard points at FS 155.11. Install two AN4-12A Bolts, NAS1149F0463P Washers (2 per bolt), and MS21044N4 Nuts. Torque AN4 bolts to 50-70 in-lbs (5.6-7.9 N-m).

25-3 BASKET REMOVAL (75102 ATTACHMENT CONFIGURATION)

Refer to Figure 25.2.

1. Pull knob at bottom end of forward beam and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in keyway on beam.
2. Pull knob at bottom end of aft beam and lift basket until lower attachment fitting is free of keyway. Keep upper basket attachment in keyway on beam.
3. Lift basket until upper attachments are out of keyways on both beams and remove basket from helicopter.

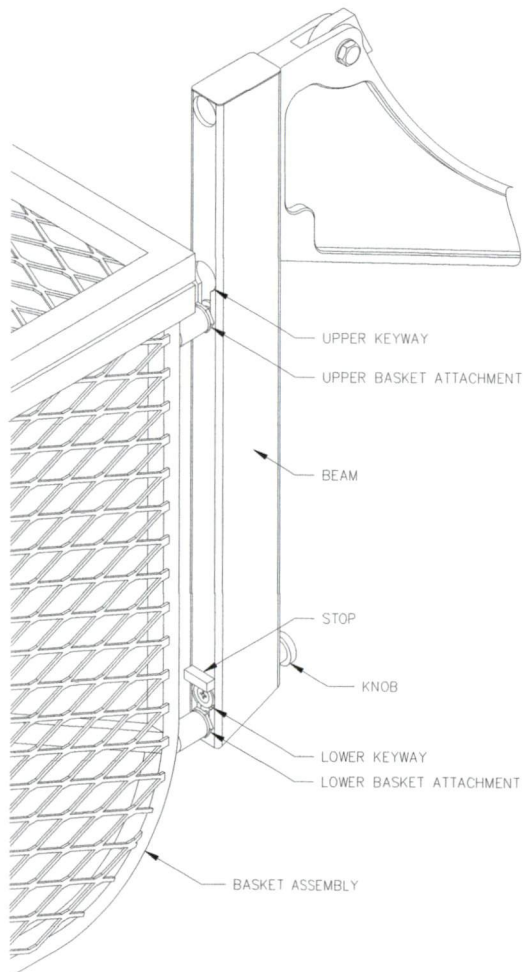


Figure 25.2 – Basket Attachment

25-4 BASKET INSTALLATION (75102 ATTACHMENT CONFIGURATION)

Refer to Figure 25.2.

1. Set basket upper attachment into upper keyway in forward and aft beams.
2. At forward end of basket, lift basket until lower attachment fitting hits stop. Push fitting into keyway and slide basket down until locked.
3. Repeat step 2 for aft end.

25-5 ATTACHMENT PROVISIONS REMOVAL (100605/100606 CONFIGURATION)

Note: It is recommended the cabin door be fully opened during installation of the 100606-01-XX High Mounted Attachment Provisions. The aft beam extends above floor level and can be rotated into the door during removal if the door is closed.

Refer to Figure 25.3.

1. Remove cargo basket, see section 25-7.
2. At forward mounting beam, remove AN5-11A bolts, NAS1149F0563P washers and MS21042-5 nuts from beam and strut at fuselage hard points. Remove forward beam with strut.
3. At forward end of drag link, remove NS21042-4 nut and NAS1149F0463P washer from fuselage hard point.
4. At aft mounting beam, remove AN4-11A bolts, NAS1149F0463P washers and MS21042-4 nuts from beam and strut at fuselage hard points. Remove aft beam with drag link.

25-6 ATTACHMENT PROVISIONS INSTALLATION (100605/100606 CONFIGURATION)

Note: It is recommended the cabin door be fully opened during installation of the 100606-01-XX High Mounted Attachment Provisions. The aft beam extends above floor level and can be rotated into the door during installation if the door is closed.

Refer to Figure 25.3.

1. At FS 84.46, locate lug on 100630-01-XX (Low) or 100632-01-XX (High) Forward Beam Assembly on upper fuselage hard point. Install AN5-11A Bolt, NAS1149F0563P Washer (2) and MS21042-5 Nut. Do not tighten nut.
2. At FS 84.46, locate 100635-01 Forward Strut on lower fuselage hard point. Install AN5-11A Bolt, NAS1149F0563P Washer (2) and MS21042-5 Nut through hard point. Install AN5-7A Bolt, NAS1149F0563P Washer (2) and MS21042-5 Nut through clevis to eye bolt at bottom of forward beam. Do not tighten nuts.
3. At FS 129.00, insert eye bolt on 100635-03 Drag Link through lower fuselage hard point. Install NAS1149F0463P Washer and MS21042-4 Nut on eye bolt. Do not tighten nut.
4. At FS 155.11, locate lug on 100631-01-XX (Low) or 100632-01-XX (High) Aft Beam Assembly on upper fuselage hard point. Install AN4-11A Bolt, NAS1149F0463P Washer (2) and MS21042-4 Nut. Do not tighten nut.

- Install AN45-7A Eye Bolt, NAS1149F0563P Washer and MS21042-5 Nut through clevis to eye bolt at bottom of aft beam. Do not tighten nuts.
6. On forward and aft mounting beams, adjust clevis on struts to align beams vertically by threading clevis in or out as required. Ensure clevis remains in safety through witness hole in clevis. Lock clevis in place with AN316-5R check nut on strut.
 7. Set horizontal spacing between forward and aft mounting beams to 71.0 inches by sliding strut eye bolt at bottom of mounting beams and with drag link on aft beam. Thread clevises equally on both ends of drag link. Ensure clevises remain in safety through witness hole in clevis. Lock clevises in place with AN316-5R check nut on strut.
 8. Install basket to check alignment of mounting beams, see section 25-8. Adjust struts and drag links as required to ensure smooth installation of basket.

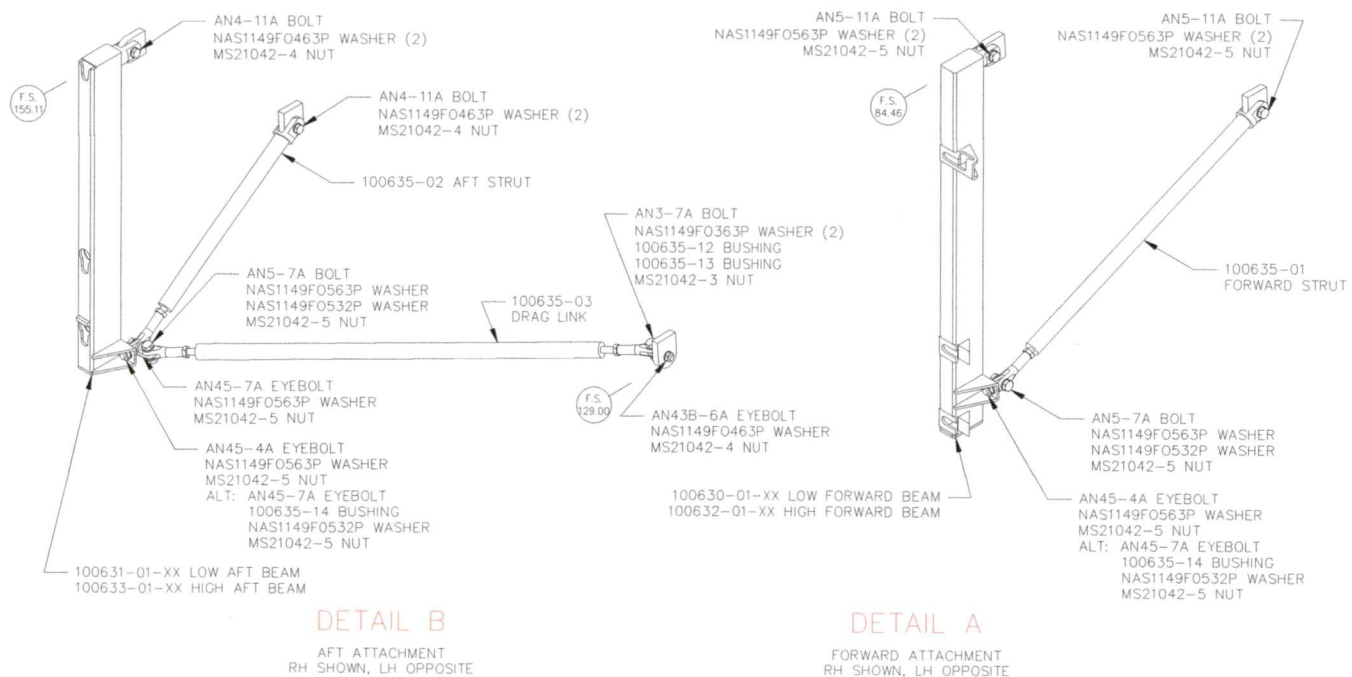
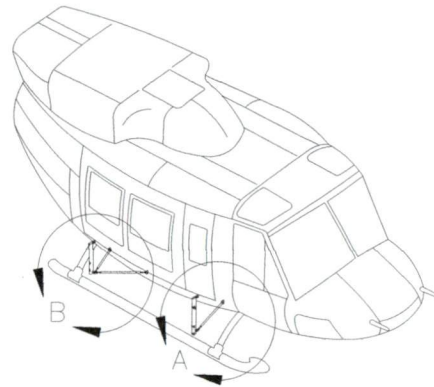


Figure 25.3 – Attachment Provisions Installation (100605/100606 Configuration)
(Right side shown, left side opposite)

9. Torque fasteners as follows:

a. AN3 Bolts:	12-15 in-lbs (1.36-1.69 N-m)
b. AN4 Bolts:	30-40 in-lbs (3.39-4.52 N-m)
c. AN5 Bolts, AN316-5R Check Nuts:	60-85 in-lbs (6.78-9.6 N-m)
d. AN43 Eye Bolt	50-70 in-lbs (5.65-7.91 N-m)
e. AN45 Eye Bolts	100-140 in-lbs (11.30-15.82 N-m)

25-7 BASKET REMOVAL (100605/100606 ATTACHMENT CONFIGURATION)

Refer to Figure 25.4.

1. At aft mounting beam, pull knob at bottom end of aft beam and lift basket until attachment fittings are free of keyways.
2. Slide basket forward to disengage lower forward attachment. Rest aft end of basket on floor.
3. At forward mounting beam, slide basket forward and raise basket until upper forward attachment is free of keyway.

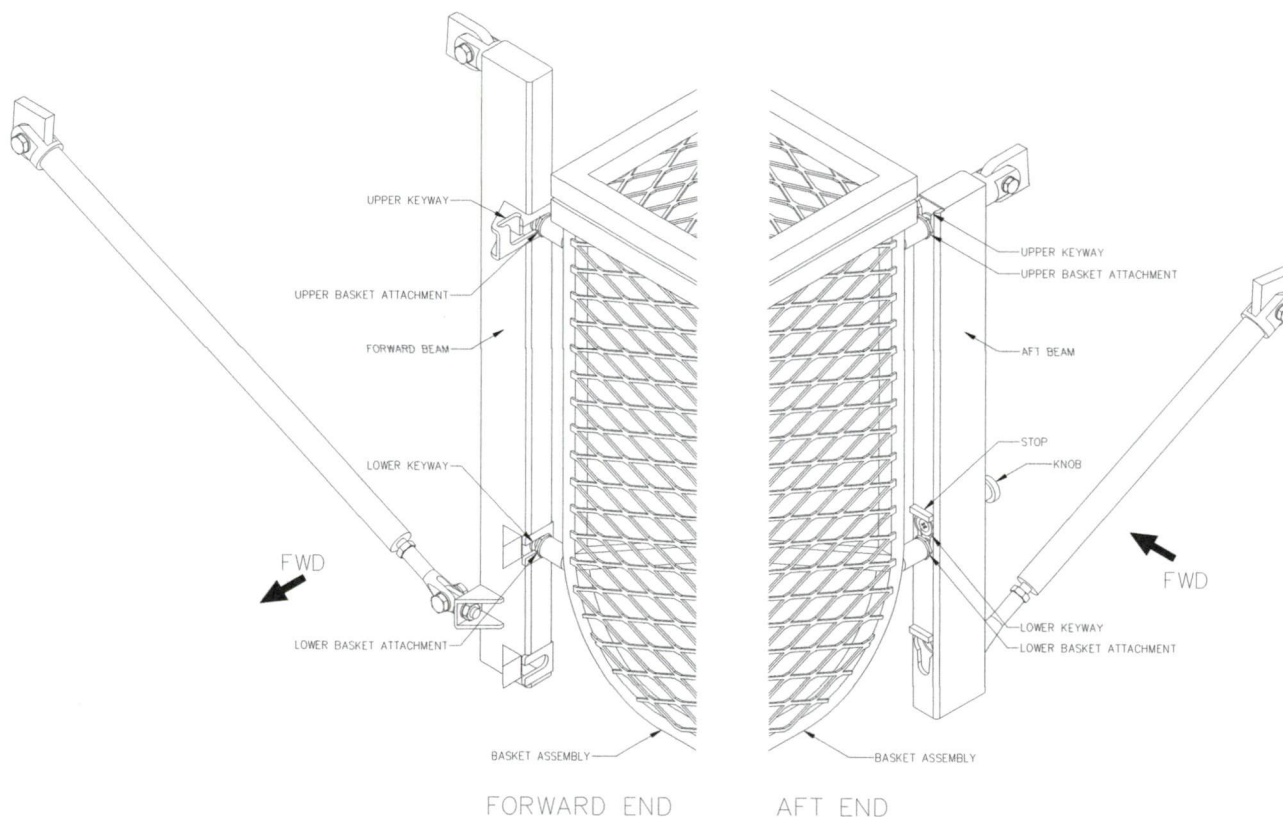


Figure 25.4 – Cargo Basket Installation
 (Left side shown, right side opposite)
 (751 Basket shown, 955 Basket similar)
 (1006 Basket similar, uses bottom keyways)

25-8 BASKET INSTALLATION (100605/100606 ATTACHMENT CONFIGURATION)

Refer to Figure 25.4.

1. Set basket upper forward attachment into upper keyway in forward beam. Aft end of basket may rest on floor.
2. Lift basket from aft end and slide lower forward attachment into keyway in forward beam.
3. Raise aft end of basket to aft beam, sliding basket aft, and lift until lower attachment fitting hits stop over keyway.
4. Push fitting into lower keyway, ensure top fitting enters top keyway, and slide basket down until locked. Pull up on aft end of basket to ensure basket is locking in place on aft beam.

25-9 HANDLE BRACKET REPLACEMENT

Refer to Figure 25.5.

1. Remove two (2) AN3-11A Bolts, NAS1149F0363P Washers and MS21044N3 Nuts from each Handle Bracket (84267-01). Remove handle brackets from basket hoops.
2. Slide two (2) replacement Handle Brackets (84267-01) onto basket hoops. Align Handle Bracket to bushings in hoop. Insert two (2) AN3-11A Bolts with NAS1149F0363P Washers through Handle Bracket and bushing. Install NAS1149F0363P Washer and MS21044N3 Nut on each bolt. Torque nuts to 20-25 in-lbs (2.3-2.8 N-m).

25-10 HANDLE SPRING REPLACEMENT

Refer to Figure 25.5.

1. Remove two (2) AN3-12A Bolts, NAS1149F0363P Washers (2) and MS21044N3 Nuts attaching handle to lid. Remove handle from basket. Remove springs from handle.
2. Slide replacement 36278-01R and 36278-01L Springs onto handle. Spring arm will catch on hook when on the correct side. Insert two 36275-01 bushings into handle attachments. Locate handle on basket, and insert two (2) AN3-12A Bolts with NAS1149F0363P Washers through bracket on lid and bushing in handle. Install NAS1149F0363P Washer and MS21044N3 Nut on each bolt. Torque nuts to 20-25 in-lbs (2.3-2.8 N-m). Lift spring arm over catch on handle and bar on lid bracket.

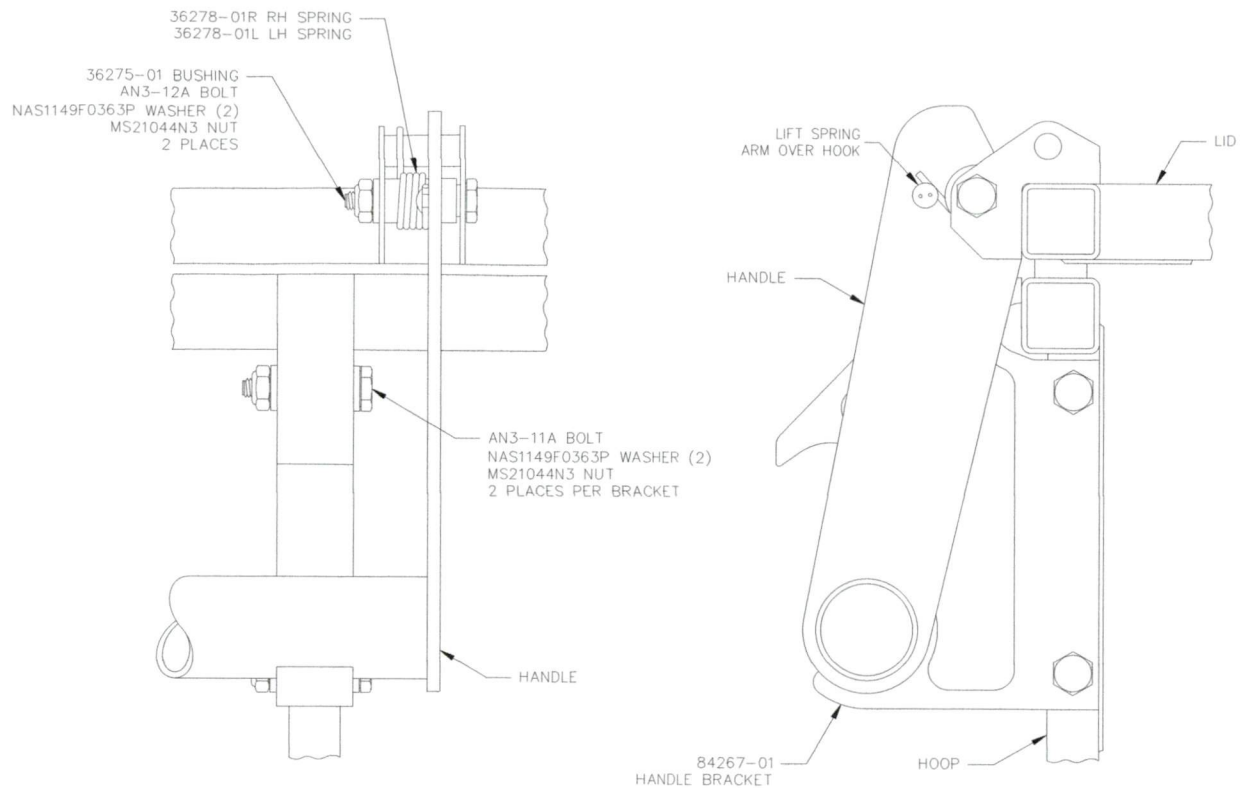


Figure 25.5 – Handle Bracket Parts

25-11 LID PROP REPLACEMENT

1. Remove AN3-15A and AN3-17A Bolts, NAS1149F0363P Washers (3), AN970-3 Washers (2) and MS21044N3 Nuts attaching lid prop to basket assembly. Remove lid prop from basket
2. Locate replacement 36280-01 Lid Prop on bushings at forward end of basket and lid.
3. Insert AN970-3 Washer into lid end of prop, and slide AN3-15A Bolt with NAS1149F0363P Washer through bushing in lid. Install NAS1149F0363P Washer and MS21044N3 Nut on bolt.
4. Slide AN3-17A Bolt with AN970-3 Washer through bushing in basket. Install NAS1149F0363P Washer and MS21044N3 Nut on bolt.
5. Ensure lid prop is seated on bushings and torque nuts to 20-25 in-lbs (2.3-2.8 N-m).

25-12 QUICK RELEASE PIN SPRING REPLACEMENT

1. Remove basket from mounting beams, refer to section 25-3 or 25-7 as applicable.
2. At lower attachment keyway on aft beam, remove MS21044C3 Nut from #10-32 stainless steel countersunk screw and remove 69830-13 Knob, 69830-12 Stop, and 69830-23 Spring. Discard defective Spring.

3. Place 69830-12 Stop on #10-32 stainless steel countersunk screw. Slide replacement 69830-23 Spring onto Stop. Insert screw/Stop/Spring into guide in lower keyway of beam. Install 69830-13 Knob and MS21044C3 Nut on inboard side of beam. Torque nut to 20-25 in-lbs (2.3-2.8 N-m).

25-13 BILL OF MATERIALS

75102 MOUNTING PROVISIONS INSTALLATION

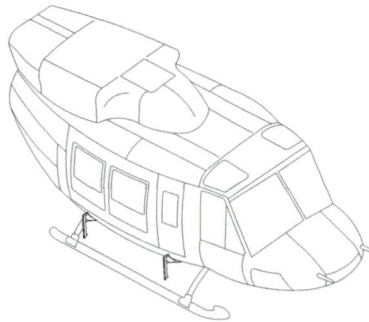


Figure 25.6 – 75102 Mounting Provisions Installation

Qty.	Part Number	Description
1	75102-01	Mounting Provisions Installation
. 1	75115-01	Forward Mounting Beam Assembly
. 1	75116-01	Aft Mounting Beam Assembly
. 2	AN5-12A	Bolt
. 4	NAS1149FO563P	Washer
. 2	MS21044N5	Nut
. 2	AN4-12A	Bolt
. 4	NAS1149FO463P	Washer
. 2	MS21044N4	Nut

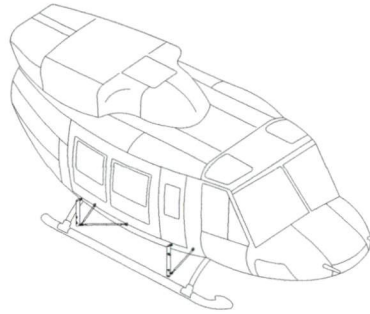
100605 / 100606 EXTERNAL ATTACHMENT PROVISIONS INSTALLATION

Figure 25.7 – 100605/100606 External Attachment Provisions Installation

Qty.	Part Number	Description
1	100605-01-XX	External Attachment Provisions Installation, Low Mounted
. 1	100630-01-XX	Forward Mounting Beam Assembly, Low
. 1	100631-01-XX	Aft Mounting Beam Assembly, Low
1	100606-01-XX	External Attachment Provisions Installation, High Mounted
. 1	100632-01-XX	Forward Mounting Beam Assembly, High
. 1	100633-01-XX	Aft Mounting Beam Assembly, High
		All continued
. 1	100635-01	Forward Strut
. 1	100635-02	Aft Strut
. 1	100635-03	Drag Link
. 1	100635-12	Bushing
. 1	100635-13	Bushing
. 2	AN5-7A	Bolt
. 2	AN5-11A	Bolt
. 2	AN45-4A	Eye Bolt
. 1	AN45-7A	Eye Bolt
. 2	AN4-11A	Bolt
. 1	AN43B-6A	Eye Bolt
. 1	AN3-7A	Bolt
. 9	NAS1149FO563P	Washer
. 2	NAS1149FO532P	Washer
. 5	NAS1149FO463P	Washer
. 2	NAS1149FO363P	Washer
. 7	MS21042-5	Nut
. 3	MS21042-4	Nut
. 1	MS21042-3	Nut

751 STANDARD CARGO BASKET INSTALLATION

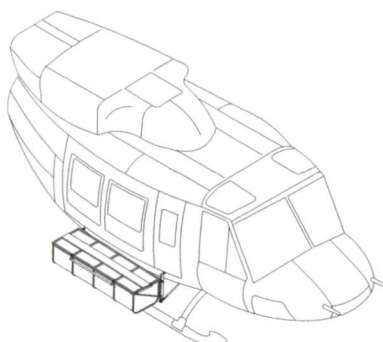


Figure 25.8 – 751 Standard Cargo Basket Installation

Qty.	Part Number	Description
1	75101-01	Basket Installation, Standard
. 1	75102-01	Mounting Provisions Installation
. 1	75110-01	Basket Assembly, Standard
1	75103-01-XX	Basket Installation, Standard, Low Mounted
. 1	100605-01-XX	External Attachment Provisions Installation, Low Mounted
. 1	75110-01	Basket Assembly, Standard
1	75103-02-XX	Basket Installation, Standard, High Mounted
. 1	100606-01-XX	External Attachment Provisions Installation, High Mounted
. 1	75110-01	Basket Assembly, Standard

955 EXTRA LARGE CARGO BASKET INSTALLATION

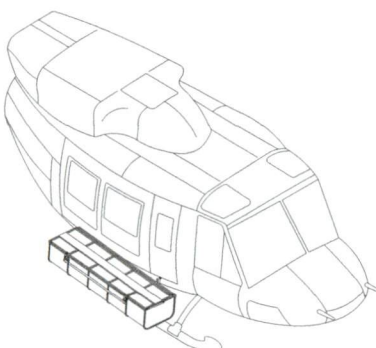


Figure 25.9 – 955 Extra Large Cargo Basket Installation

Qty.	Part Number	Description
1	95501-01-XX	Basket Installation, Extra Large
. 1	75102-01	Mounting Provisions Installation
. 1	95510-01-XX	Basket Assembly, Extra Large
1	95502-01-XX	Basket Installation, Extra Large, Low Mounted
. 1	100605-01-XX	External Attachment Provisions Installation, Low Mounted
. 1	95510-01-XX	Basket Assembly, Extra Large
1	95503-02-XX	Basket Installation, Extra Large, High Mounted
. 1	100606-01-XX	External Attachment Provisions Installation, High Mounted
. 1	95510-01-XX	Basket Assembly, Extra Large

1006 MEGA CARGO BASKET INSTALLATION

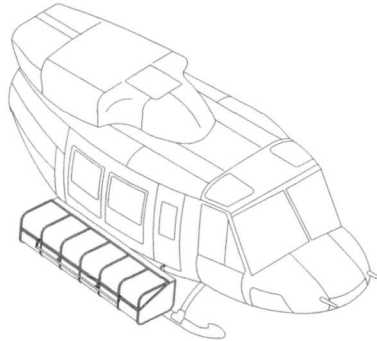


Figure 25.10 – 1006 Mega Cargo Basket Installation

Qty.	Part Number	Description
1	100601-01-XX	Mega Basket Installation, Standard Lid, Low Mounted
. 1	100605-01-XX	External Attachment Provisions Installation, Low Mounted
. 1	100610-01-XX	Mega Basket Assembly, Standard Lid
1	100601-02-XX	Mega Basket Installation, Standard Lid, High Mounted
. 1	100606-01-XX	External Attachment Provisions Installation, High Mounted
. 1	100610-01-XX	Mega Basket Assembly, Standard Lid
1	100602-01-XX	Mega Basket Installation, Extended Lid, Low Mounted
. 1	100605-01-XX	External Attachment Provisions Installation, Low Mounted
. 1	100610-02-XX	Mega Basket Assembly, Extended Lid
1	100602-02-XX	Mega Basket Installation, Extended Lid, High Mounted
. 1	100606-01-XX	External Attachment Provisions Installation, High Mounted
. 1	100610-02-XX	Mega Basket Assembly, Extended Lid

25-14 WEIGHT AND BALANCE

Two weight and balance configurations are required. The first is the installation of Attachment Provisions only. The second is Cargo Basket and Attachment Provisions as the basket may be removed or installed in the field.

1. 751 Standard Cargo Basket Configuration

Standard Units						
Part #	Name	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
75102 Attachment Provisions						
75102-01	Mounting Provisions Installation	9.6	118.3	1136.0	46.6	447.6
75110-01	Cargo Basket, Standard	49.5	119.5	5915.3	62.2	3078.9
75101-01	Basket Installation (Total)	59.1	119.3	7051.3	59.7	3526.5
100605 Low Mount Attachment Provisions						
100605-01-XX	Mounting Provisions Installation	11.2	120.6	1351.2	45.8	513.4
75110-01	Cargo Basket, Standard	49.5	121.0	5989.5	61.0	3019.5
75103-01-XX	Basket Installation (Total)	60.7	120.9	7340.7	58.2	3532.9
100606 High Mount Attachment Provisions						
100606-01-XX	Mounting Provisions Installation	11.6	124.0	1438.6	45.9	532.2
75110-01	Cargo Basket, Standard	49.5	121.3	6004.9	61.0	3019.5
75103-01-XX	Basket Installation (Total)	61.1	121.8	7443.5	58.13	3551.7

Metric Units						
Part #	Name	Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
75102 Attachment Provisions						
75102-01	Mounting Provisions Installation	4.4	3006	13088	1184	5157
75110-01	Cargo Basket, Standard	22.5	3035	68151	1580	35473
75101-01	Basket Installation (Total)	26.8	3030	81239	1516	40630
100605 Low Mount Attachment Provisions						
100605-01-XX	Attachment Provisions Installation	5.1	3064	15567	1164	5915
75110-01	Cargo Basket, Standard	22.5	3073	69007	1549	34788
75103-01-XX	Basket Installation (Total)	27.5	3072	84574	1478	40703
100606 High Mount Attachment Provisions						
100606-01-XX	Attachment Provisions Installation	5.3	3150	16575	1165	6131
75110-01	Cargo Basket, Standard	22.5	3081	69183	1549	34788
75103-01-XX	Basket Installation (Total)	27.7	3094	85758	1476	40920

Note: Lateral arms are given for right side installation (XX = -02). For installation on left side (XX = -01), lateral arms are negative.

2. 955 Extra Large Cargo Basket Configuration

Standard Units						
Part #	Name	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
75102 Attachment Provisions						
75102-01	Mounting Provisions Installation	9.6	118.3	1136.0	46.6	447.6
95510-01-XX	Cargo Basket, Extra Large	66.8	111.1	7421.5	63.9	4268.5
75101-01	Basket Installation (Total)	76.4	112.0	8557.5	61.7	4715.5
100605 Low Mount Attachment Provisions						
100605-01-XX	Mounting Provisions Installation	11.2	120.6	1351.2	45.8	513.4
95510-01-XX	Cargo Basket, Extra Large	66.8	111.7	7461.6	62.7	4188.4
95502-01-XX	Basket Installation (Total)	78.0	113.0	8812.7	60.3	4701.8
100606 High Mount Attachment Provisions						
100606-01-XX	Mounting Provisions Installation	11.6	124.0	1438.6	45.9	532.2
95510-01-XX	Cargo Basket, Extra Large	66.8	111.4	7441.5	62.7	4188.4
95502-01-XX	Basket Installation (Total)	78.4	113.3	8880.2	60.2	4720.6

Metric Units						
Part #	Name	Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
75102 Attachment Provisions						
75102-01	Mounting Provisions Installation	4.4	3006	13088	1184	5157
95510-01-XX	Cargo Basket, Extra Large	30.3	2822	85505	1623	49180
95501-01-XX	Basket Installation (Total)	34.7	2845	98576	1567	54329
100605 Low Mount Attachment Provisions						
100605-01-XX	Mounting Provisions Installation	5.1	3064	15567	1164	5915
95510-01-XX	Cargo Basket, Extra Large	30.3	2837	85967	1593	48255
95502-01-XX	Basket Installation (Total)	35.4	2870	101534	1531	54170
100606 High Mount Attachment Provisions						
100606-01-XX	Mounting Provisions Installation	5.3	3150	16575	1165	6131
95510-01-XX	Cargo Basket, Extra Large	30.3	2830	85736	1593	48255
95502-01-XX	Basket Installation (Total)	35.6	2877	102311	1529	54387

Note: Lateral arms are given for right side installation (-XX = -02). For installation on left side (-XX = -01), lateral arms are negative.

3. 1006 Mega Cargo Basket Configuration

Standard Units						
Part #	Name	Weight (lbs)	Longitudinal		Lateral	
			Arm (in)	Moment (in-lbs)	Arm (in)	Moment (in-lbs)
Standard Lid Configuration (Flat Lid)						
<i>100605 Low Mount Attachment Provisions</i>						
100605-01-XX	Mounting Provisions Installation	11.2	120.6	1351.2	45.8	513.4
100610-01	Mega Cargo Basket, Std. Lid	100.0	121.0	12100.0	64.7	6469.0
100601-01-XX	Basket Installation (Total)	111.2	121.0	13451.2	62.8	6982.4
<i>100606 High Mount Attachment Provisions</i>						
100606-01-XX	Mounting Provisions Installation	11.6	124.0	1438.6	45.9	532.2
100610-01	Mega Cargo Basket, Std. Lid	100.0	121.3	12131.0	64.7	6469.0
100601-02-XX	Basket Installation (Total)	111.6	121.6	13569.6	62.7	7001.2
Extended Lid Configuration (Tall Lid)						
<i>100605 Low Mount Attachment Provisions</i>						
100605-01-XX	Mounting Provisions Installation	11.2	120.6	1351.2	45.8	513.4
100610-02	Mega Cargo Basket, Ext. Lid	107.2	121.0	12971.2	65.2	6988.4
100602-01-XX	Basket Installation (Total)	118.4	121.0	14322.4	63.4	7501.8
<i>100606 High Mount Attachment Provisions</i>						
100606-01-XX	Mounting Provisions Installation	11.6	124.0	1438.6	45.9	532.2
100610-02	Mega Cargo Basket, Ext. Lid	107.2	121.3	13004.4	65.2	6988.4
100602-02-XX	Basket Installation (Total)	118.8	121.6	14443.1	63.3	7520.6

Metric Units						
Part #	Name	Weight (kg)	Longitudinal		Lateral	
			Arm (mm)	Moment (mm-kg)	Arm (mm)	Moment (mm-kg)
Standard Lid Configuration (Flat Lid)						
<i>100605 Low Mount Attachment Provisions</i>						
100605-01-XX	Mounting Provisions Installation	5.1	3064	15567	1164	5915
100610-01	Mega Cargo Basket, Std. Lid	45.4	3073	139407	1643	74531
100601-01-XX	Basket Installation (Total)	50.4	3072	154974	1595	80446
<i>100606 High Mount Attachment Provisions</i>						
100606-01-XX	Mounting Provisions Installation	5.3	3150	16575	1165	6131
100610-01	Mega Cargo Basket, Std. Lid	45.4	3081	139764	1643	74531
100601-02-XX	Basket Installation (Total)	50.6	3088	156339	1593	80663
Extended Lid Configuration (Tall Lid)						
<i>100605 Low Mount Attachment Provisions</i>						
100605-01-XX	Mounting Provisions Installation	5.1	3064	15567	1164	5915
100610-02	Mega Cargo Basket, Ext. Lid	48.6	3073	149445	1656	80515
100602-01-XX	Basket Installation (Total)	53.7	3073	165012	1609	86430
<i>100606 High Mount Attachment Provisions</i>						
100606-01-XX	Mounting Provisions Installation	5.3	3150	16575	1165	6131
100610-02	Mega Cargo Basket, Std. Lid	48.6	3081	149827	1656	80515
100602-02-XX	Basket Installation (Total)	53.9	3088	166402	1608	86646

Note: Lateral arms are given for right side installation (-XX = -02). For installation on left side (-XX = -01), lateral arms are negative.

4. Options

If the basket includes any of the following options, include these corrections to the weight and balance data.

Standard Units						
P/N	Description	Weight	Longitudinal		Lateral	
		lb	arm in	moment in-lb	arm in	Moment in-lb
70407-01	Front End Cutout	-0.3	84.5	-25.4	*	*
70405-01	Lid Step (751 Basket)	5.0	119.5	597.5	*	*
70405-01	Lid Step (955 Basket)	6.5	111.1	722.2	*	*
70408-01	Hangar Wheel (751 Basket)	0.8	153.5	122.8	*	*
70408-01	Hangar Wheel (955 Basket)	0.8	153.5	122.8	*	*
70408-01	Hangar Wheel (1006 Basket)	1.6	172.0	275.2	*	*

Metric Units						
P/N	Description	Weight	Longitudinal		Lateral	
		kg	arm mm	Moment mm-kg	arm mm	Moment mm-kg
70406-01	Front End Cutout	-0.1	2146	-291	*	*
70405-01	Lid Step (751 Basket)	2.3	3035	6889	*	*
70405-01	Lid Step (955 Basket)	2.9	2822	8325	*	*
70408-01	Hangar Wheel (751 Basket)	0.4	3899	1404	*	*
70408-01	Hangar Wheel (955 Basket)	0.4	3899	1404	*	*
70408-01	Hangar Wheel (1006 Basket)	0.7	4369	3171	*	*

*Note: Lateral arm is the same as the basket configuration. Lateral moment is calculated with the lateral arm.

25-15 STRUCTURAL FASTENER DATA

Refer to Bell Standard Practices Manual BHT-ALL-SPM for torque values not listed in this ICA.

same line

bars

73.4

79.6

77.6

73.4

67.2

70.8

69.2

70.2

76.8

66.6

69.4

70.4

76

75.6

82.8

71.8

04 Dec 2014

1170.8 Bars

~~1100~~

1491.6 Bags

2662.4

71 x 25

1775

2660

- 1775

885

876

2660

- 1170.8

1489.2

÷

25

59.568

60 Bags

1741
~~#70~~

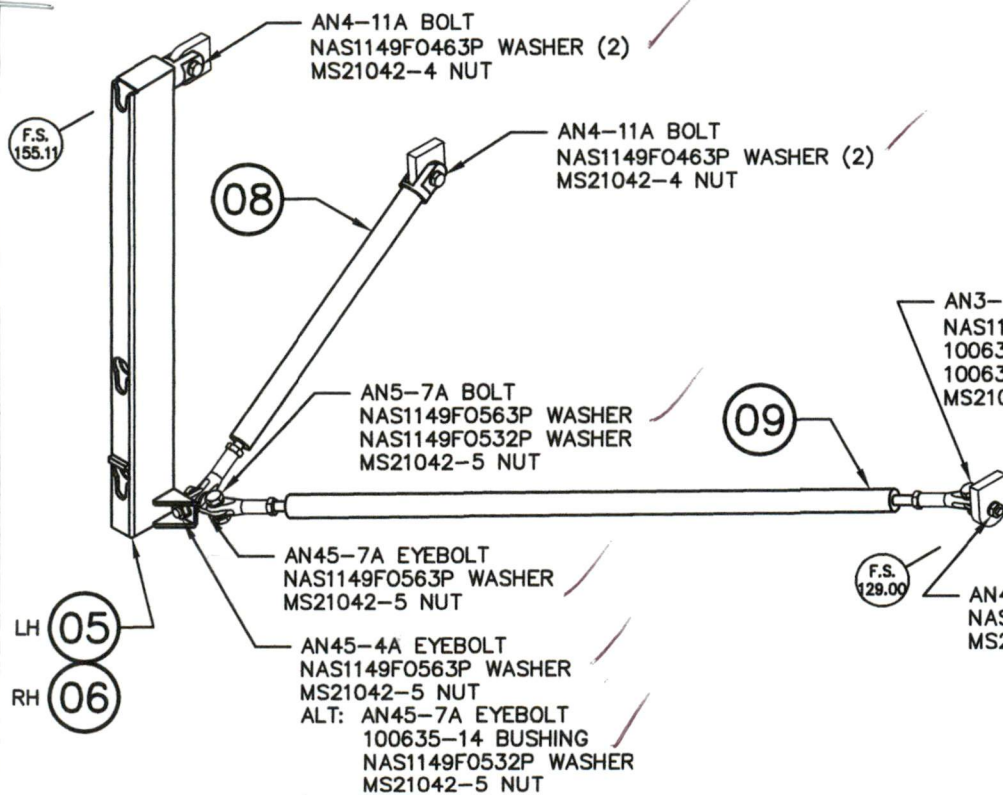
$$\begin{array}{r} 1741 \\ - 1491.6 \\ \hline 249.4 \end{array}$$

$$\begin{array}{r} 1491.6 \\ 289.2 \\ \hline 1780.8 \end{array}$$

Limit

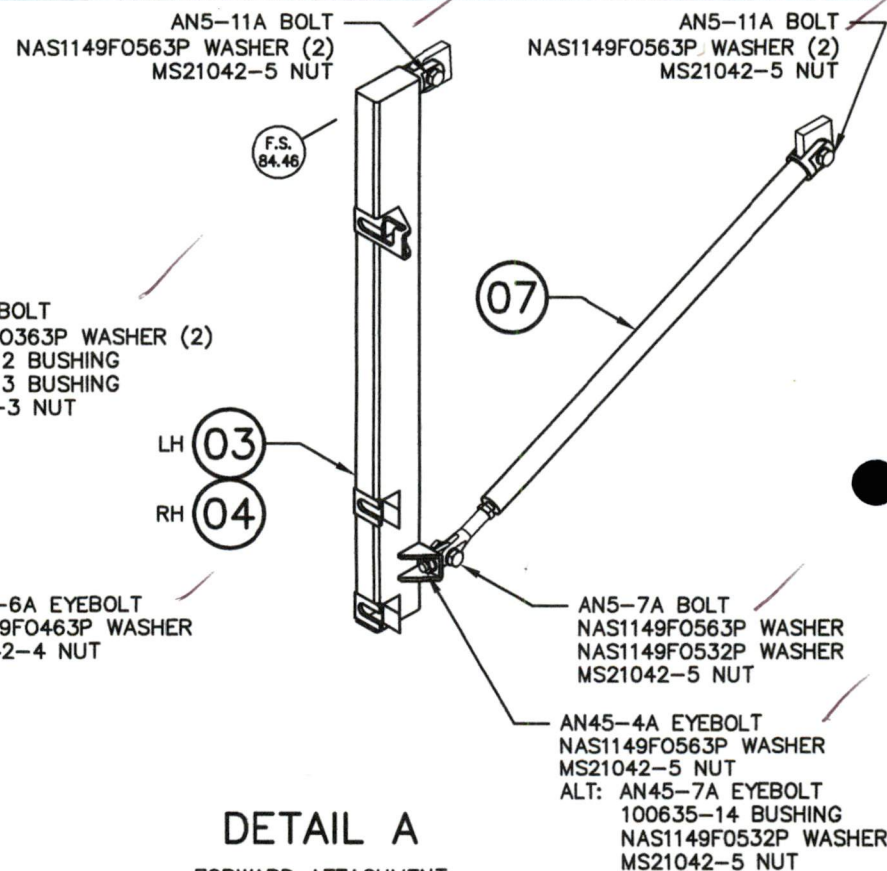
2662.4

Ultimate



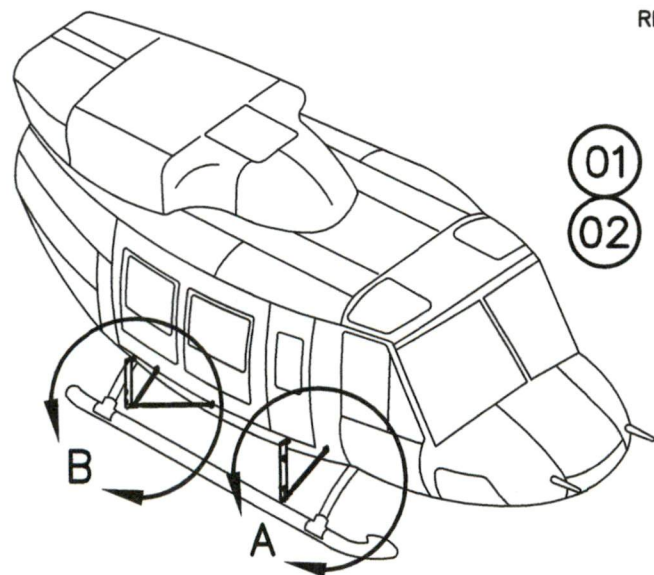
DETAIL B

AFT ATTACHMENT
RH SHOWN, LH OPPOSITE




DETAIL A

FORWARD ATTACHMENT
RH SHOWN, LH OPPOSITE



- 01 EXTERNAL ATTACH. PROVISIONS, LOW MOUNTED, LH
- 02 EXTERNAL ATTACH. PROVISIONS, LOW MOUNTED, RH

APPROVALS		DATE			AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G5 TEL: 604.483.2376 www.aerodesign.ca	
DRAWN: JEFF CLARKE		24 NOV 2014				
CHECKED: JASON REKVE		27 Nov 14				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:				BELL 205, 212, 214, 412 SERIES EXTERNAL ATTACHMENT PROVISIONS LOW MOUNTED INSTALLATION		
DECIMALS		ANGLES				
X.XXX ±0.010		±1/2°				
X.XX ±0.03				NOT TO SCALE		
X.X ±0.1						
				SHEET 1 OF 2		
				A4 100605 0 B		

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE	*	*

NOTES:

1. SEE INSTRUCTIONS FOR CONTINUED AIRWORTHINESS, ICA751.90, FOR MAINTENANCE INFORMATION.
2. INSTALLATION PROCEDURE:
 - A) INSTALL FORWARD AND AFT BEAM ON UPPER FUSELAGE HARD POINTS. DO NOT FULLY TIGHTEN BOLTS.
 - B) INSTALL FORWARD AND AFT STRUTS FROM BEAM TO LOWER FUSELAGE HARD POINTS. DO NOT TIGHTEN BOLTS.
 - C) ALIGN FORWARD AND AFT BEAMS TO BE PARALLEL WHEN VIEWED FROM THE FRONT OR BACK. THREAD CLEVIS ON STRUTS IN OR OUT TO ADJUST.
 - D) INSTALL DRAG LINK FROM AFT BEAM TO LOWER FUSELAGE HARD POINT AT FS. 129.00. THREAD CLEVIS ON BOTH ENDS IN OR OUT TO ADJUST.
 - E) ADJUST DRAG LINK FOR CENTRE TO CENTRE SPACING OF BEAMS TO 71.0 INCHES (1803 mm).
 - F) TIGHTEN ALL FASTENERS AND CHECK NUTS PER NOTE 3.
3. TORQUE FASTENERS AS FOLLOWS:
 - A) AN3 BOLTS: 12-15 IN-LBS (1.36-1.69 N-m)
 - B) AN4 BOLTS: 30-40 IN-LBS (3.39-4.52 N-m)
 - C) AN5 BOLTS, AN316-5 CHECK NUTS: 60-85 IN-LBS (6.78-9.60 N-m)
 - D) AN43 EYE BOLT: 50-70 IN-LBS (5.65-7.91 N-m)
 - E) AN45 EYE BOLTS: 100-140 IN-LBS (11.30-15.82 N-m)

1	1	MS21042-3	NUT (ALT: MS21042L3, MS21044N3)
3	3	MS21042-4	NUT (ALT: MS21042L4, MS21044N4)
7	7	MS21042-5	NUT (ALT: MS21042L5, MS21044N5)
2	2	NAS1149FO363P	WASHER
5	5	NAS1149FO463P	WASHER
2	2	NAS1149FO532P	WASHER
9	9	NAS1149FO563P	WASHER
1	1	AN3-7A	BOLT
1	1	AN43B-6A	EYE BOLT
2	2	AN4-11A	BOLT
1	1	AN45-7A	EYE BOLT
2	2	AN45-4A	EYE BOLT (ALT: AN45-7A WITH 100635-14 BUSHING)
2	2	AN5-7A	BOLT
2	2	AN5-11A	BOLT
1	1	100635-04	BUSHING
1	1	100635-03	09 DRAG LINK
1	1	100635-02	08 AFT STRUT
1	1	100635-01	07 FORWARD STRUT
1		100631-01-02	06 AFT BEAM, LOW MOUNTED, RH
	1	100631-01-01	05 AFT BEAM, LOW MOUNTED, LH
1		100630-01-02	04 FORWARD BEAM, LOW MOUNTED, RH
	1	100630-01-01	03 FORWARD BEAM, LOW MOUNTED, LH
		100605-01-02	02 EXTERNAL ATTACHMENT PROVISIONS, LOW MOUNTED, RH
		100605-01-01	01 EXTERNAL ATTACHMENT PROVISIONS, LOW MOUNTED, LH

QTY	QTY	PART NO.	ITEM	DESCRIPTION
				LIST OF MATERIALS

WEIGHT AND BALANCE - METRIC

ITEM	DESCRIPTION	WEIGHT (kg)	LONGITUDINAL		LATERAL	
			ARM (mm)	MOMENT (mm-kg)	ARM (mm)	MOMENT (mm-kg)
	EXTERNAL ATTACHMENT PROVISIONS INSTALLATION					
01	LOW MOUNTED, LH	5.1	3064	15567	-1164	-5915
02	LOW MOUNTED, RH	5.1	3064	15567	1164	5915

WEIGHT AND BALANCE - STANDARD

ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
EXTERNAL ATTACHMENT PROVISIONS INSTALLATION						
01	LOW MOUNTED, LH	11.2	120.64	1351.2	-45.84	-513.4
02	LOW MOUNTED, RH	11.2	120.64	1351.2	45.84	513.4

APPROVALS	DATE
DRAWN: JEFF CLARKE	24 NOV 2014
CHECKED: JASON REKVE	27 NOV 14



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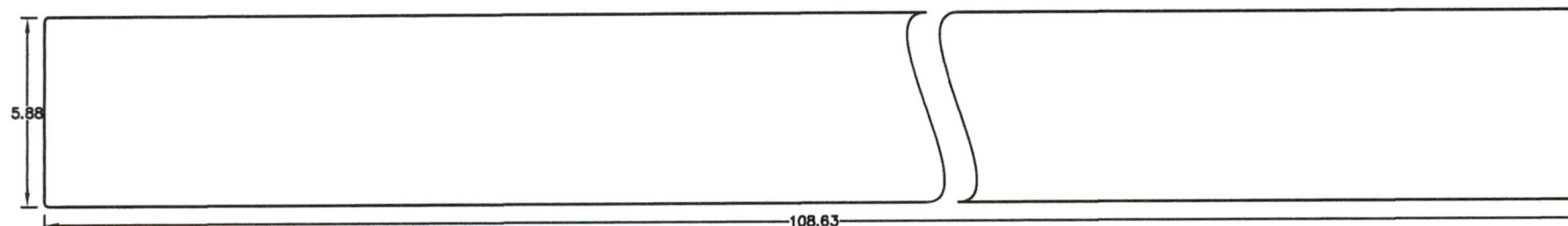
9888A MALASPINA ROAD
POWELL RIVER, BC, CANADA, V8A 0G5
TEL: 604.489.2376 www.aerodesign.ca

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2"
X.XX ±0.03
X.X ±0.1

BELL 205, 212, 214, 412 SERIES
EXTERNAL ATTACHMENT PROVISIONS
LOW MOUNTED INSTALLATION

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.	CHG.
SHEET 2 OF 2	A4	100605	0	B


REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		



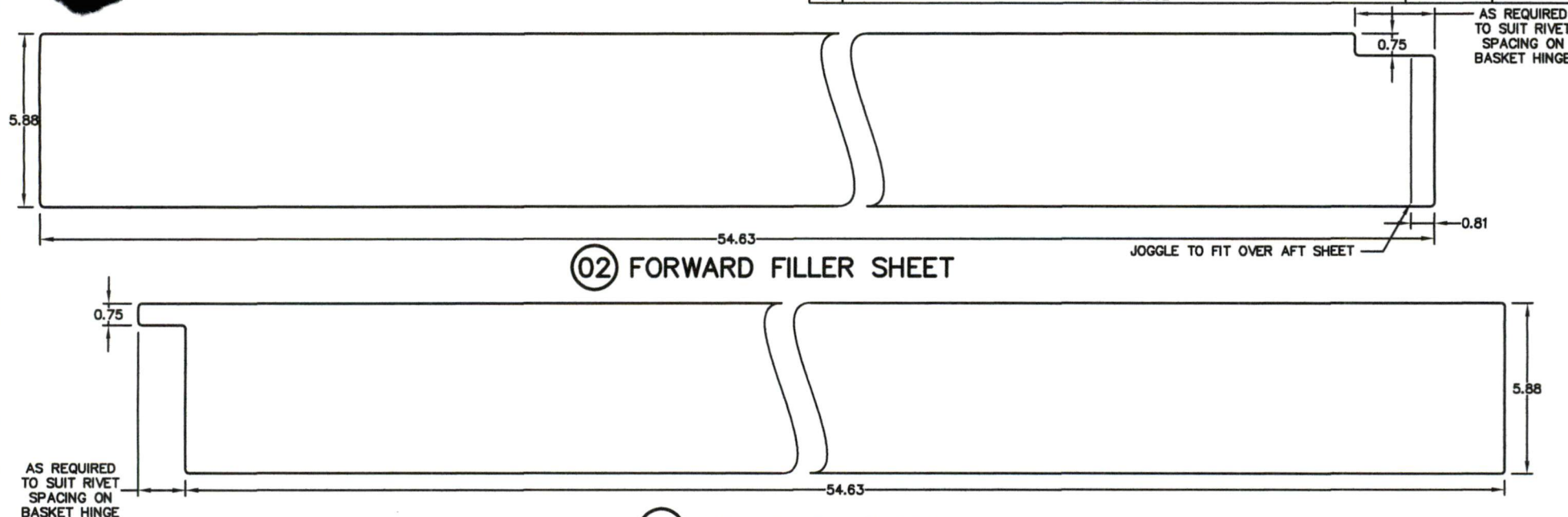
① FILLER SHEET *Split sheet?*

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. THOROUGHLY DEGREASE, ALODINE, EPOXY PRIME AND POLYURETHANE PAINT ALL ALUMINUM PARTS PRIOR TO ASSEMBLY.
ALTERNATE: THOROUGHLY DEGREASE AND POWDER COAT ALL ALUMINUM PARTS PRIOR TO ASSEMBLY.

1	100616-01	01	FILLER SHEET	6061-T6 ALUMINUM	QQ-A-250/11	0.050" SHEET	
	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE	
QTY	LIST OF MATERIALS						
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			DRAWN: JEFF CLARKE	26 NOV 2014			
			CHECKED: JASON REKVE	27 Nov 14			
			UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1				
BELL 205, 212, 214, 412 SERIES QUICK RELEASE MEGA CARGO BASKET FILLER SHEET							
SCALE 1 : 4 SHEET 1 OF 2				DWG. SIZE	DWG. NO.	REV.	CHG.
				LGL	100616	0	A

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		



03 AFT FILLER SHEET

1	100616-03	03	AFT FILLER SHEET	6061-T6 ALUMINUM	QQ-A-250/11	0.050" SHEET
1	100616-02	02	FORWARD FILLER SHEET	6061-T6 ALUMINUM	QQ-A-250/11	0.050" SHEET
	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE

QTY	LIST OF MATERIALS
-----	-------------------

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. THOROUGHLY DEGREASE, ALODINE, EPOXY PRIME AND POLYURETHANE PAINT ALL ALUMINUM PARTS PRIOR TO ASSEMBLY.
ALTERNATE: THOROUGHLY DEGREASE AND POWDER COAT ALL ALUMINUM PARTS PRIOR TO ASSEMBLY.

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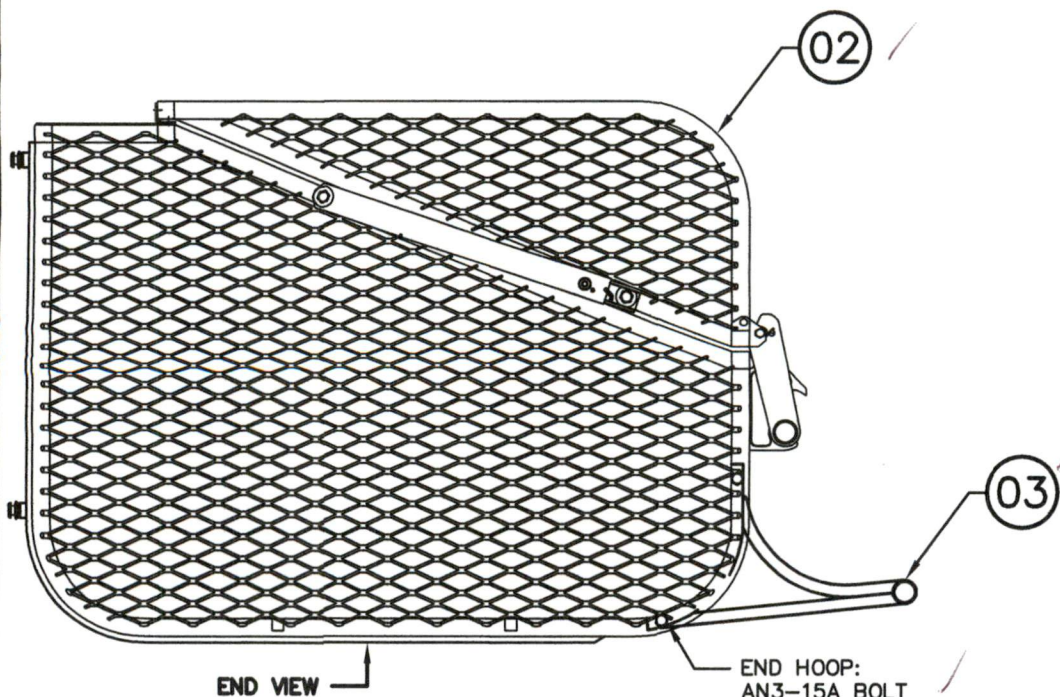
APPROVALS	DATE
DRAWN: JEFF CLARKE	26 NOV 2014
CHECKED: JASON REKVE	27 Nov 14
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:	
DECIMALS	ANGLES
X.XXX ±0.010	±1/2°
X.XX ±0.03	
X.X ±0.1	

 AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.483.2376 www.aerodesign.ca		BELL 205, 212, 214, 412 SERIES QUICK RELEASE MEGA CARGO BASKET FILLER SHEET	
		SCALE 1 : 4	CHG.
DWG. SIZE	DWG. NO.	REV.	CHG.
LGL	100616	0	A

SHEET 2 OF 2

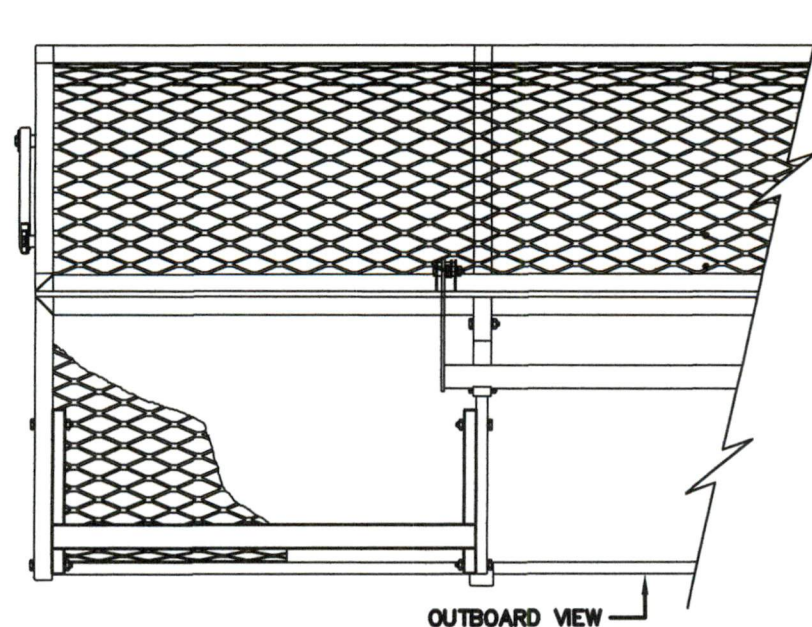
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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		



END HOOP:
AN3-15A BOLT
NAS1149FO363P WASHER (2)
MS21044N3 NUT
2 PLACES

SECOND HOOP:
AN3-13A BOLT
NAS1149FO363P WASHER (2)
MS21044N3 NUT
2 PLACES



(01) STEP INSTALLATION

W+B #?

4	MS21044N3		NUT
8	NAS1149FO363P		WASHER
2	AN3-15A		BOLT
2	AN3-13A		BOLT
1	100650-01	03	STEP ASSEMBLY
1	100610-02		ALTERNATE: CARGO BASKET ASSEMBLY – EXTENDED LID
	100610-01	02	CARGO BASKET ASSEMBLY – STANDARD LID
	100640-01	01	STEP INSTALLATION
01	PART NO.	ITEM	DESCRIPTION
QTY	LIST OF MATERIALS		

APPROVALS	DATE
DRAWN: JEFF CLARKE	26 NOV 2014
CHECKED: JASON REKVE	27 Nov 14
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:	
DECIMALS	ANGLES
X.XXX ±0.010	±1/2°
X.XX ±0.03	
X.X ±0.1	

		AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.489.2376 www.aerodesign.ca	
		BELL 205, 212, 214, 412 SERIES QUICK RELEASE CARGO BASKET OPTIONAL STEP MODIFICATION	
NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1	A4	100640	0
			CHG. A

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

NOTES

1. THIS INSTALLATION MAY BE APPLIED TO THE FORWARD AND/OR AFT END OF THE BASKET.
2. TORQUE AN3 BOLTS TO 20-25 IN-LBS (2.26-2.82 N-m).
3. LATERAL ARMS IN THE WEIGHT AND BALANCE ARE FOR RIGHT SIDE INSTALLATION. LEFT SIDE INSTALLATION ARMS ARE NEGATIVE.

WEIGHT AND BALANCE — METRIC

ITEM	DESCRIPTION	WEIGHT (kg)	LONGITUDINAL		LATERAL	
			ARM (mm)	MOMENT (mm-kg)	ARM (mm)	MOMENT (mm-kg)
LOW MOUNTED CONFIGURATION (100605)				1741.5		
01	INSTALLATION (FORWARD)	0.9	1935	1756	2054	1863
01	INSTALLATION (AFT)	0.9	4212	3821	2054	1863
01	INSTALLATION (BOTH)	1.8	3073	5576	2054	3726
HIGH MOUNTED CONFIGURATION (100606)				5531.4		
01	INSTALLATION (FORWARD)	0.9	1943	1763	2054	1863
01	INSTALLATION (AFT)	0.9	4219	3828	2054	1863
01	INSTALLATION (BOTH)	1.8	3081	5591	2054	3726

WEIGHT AND BALANCE — STANDARD

ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
LOW MOUNTED CONFIGURATION (100605)						
01	INSTALLATION (FORWARD)	2.0	76.19	1438.6	80.86	161.7
01	INSTALLATION (AFT)	2.0	165.81	12131.0	80.86	161.7
01	INSTALLATION (BOTH)	4.0	121.00	13569.6	80.86	323.4
HIGH MOUNTED CONFIGURATION (100606)						
01	INSTALLATION (FORWARD)	2.0	76.50	153.0	80.86	161.7
01	INSTALLATION (AFT)	2.0	166.12	332.2	80.86	161.7
01	INSTALLATION (BOTH)	4.0	121.31	485.2	80.86	323.4

APPROVALS

DATE

DRAWN: JEFF CLARKE 26 NOV 2014

CHECKED: JASON REKVE 27 NOV 14

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.

TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2°
X.XX ±0.03
X.X ±0.1

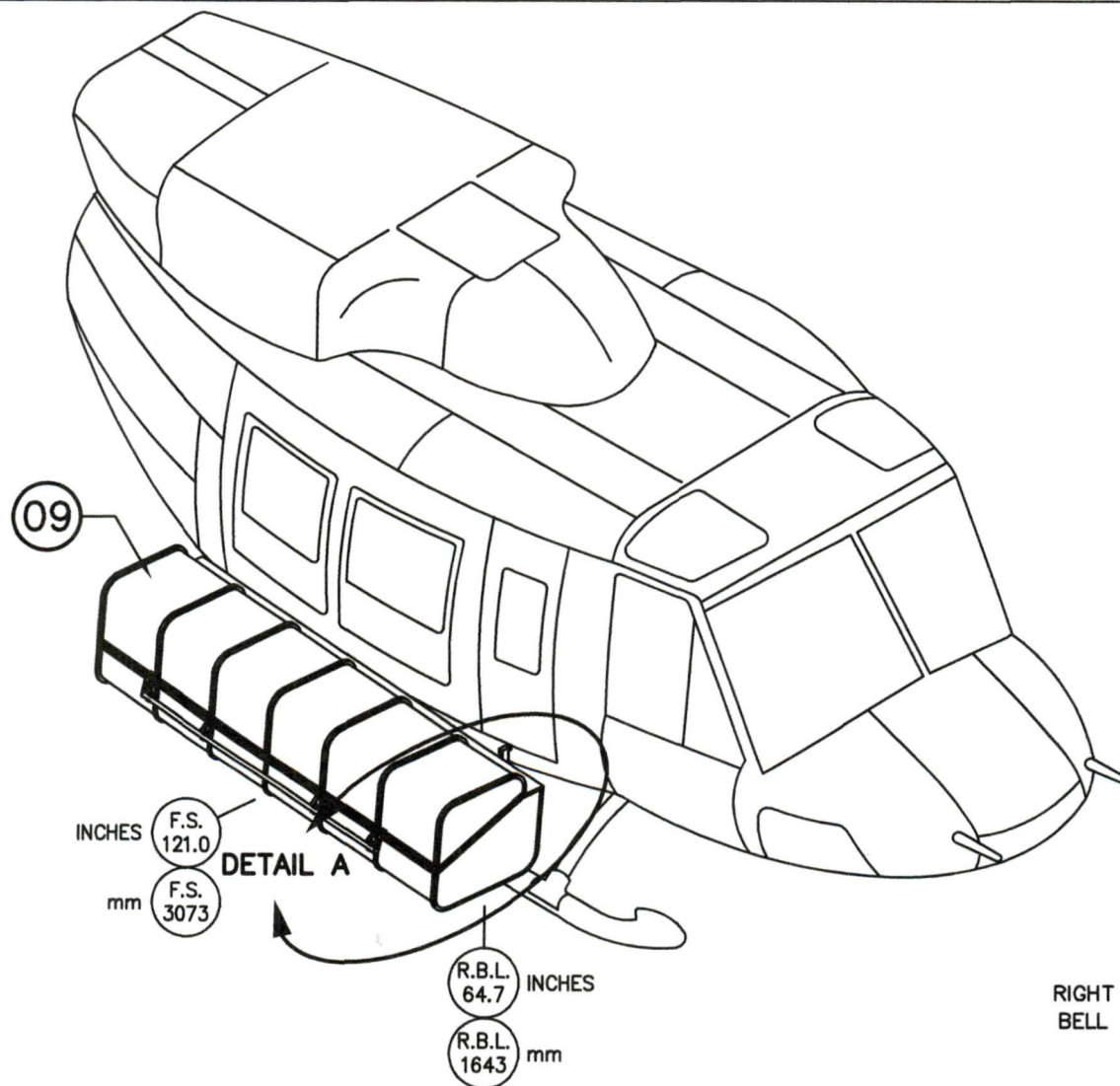


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BELL 205, 212, 214, 412 SERIES
QUICK RELEASE CARGO BASKET
OPTIONAL STEP MODIFICATION

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.	CHG.
SHEET 1 OF 1	A4	100640	0	A



- 04 INSTALLATION, HIGH RH
 03 INSTALLATION, HIGH LH
 02 INSTALLATION, LOW RH
 01 INSTALLATION, LOW LH

RIGHT SIDE INSTALLATION SHOWN, LEFT SIDE INSTALLATION OPPOSITE
 BELL 212 SHOWN; BELL 205, 214 AND 412 INSTALLATION IDENTICAL
 NOT TO SCALE

1	1	1	1	100610-02	09	CARGO BASKET ASSEMBLY - EXTENDED LID
1				100606-01-02	08	EXTERNAL ATTACHMENT PROVISIONS, HIGH, RH
	1			100606-01-01	07	EXTERNAL ATTACHMENT PROVISIONS, HIGH, LH
		1		100605-01-02	06	EXTERNAL ATTACHMENT PROVISIONS, LOW, RH
			1	100605-01-01	05	EXTERNAL ATTACHMENT PROVISIONS, LOW, LH
				100602-02-02	04	BASKET INSTALLATION, HIGH, RH
				100602-02-01	03	BASKET INSTALLATION, HIGH, LH
				100602-01-02	02	BASKET INSTALLATION, LOW, RH
				100602-01-01	01	BASKET INSTALLATION, LOW, LH
04	03	02	01	PART NO.	ITEM	DESCRIPTION
QTY	QTY	QTY	QTY	LIST OF MATERIALS		

APPROVALS	DATE
DRAWN: JEFF CLARKE	24 NOV 2014
CHECKED: JASON REKVE	27 Nov 14

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES.
 TOLERANCES ON:
 DECIMALS ANGLES
 X.XXX ±0.010 ±1/2°
 X.XX ±0.03
 X.X ±0.1

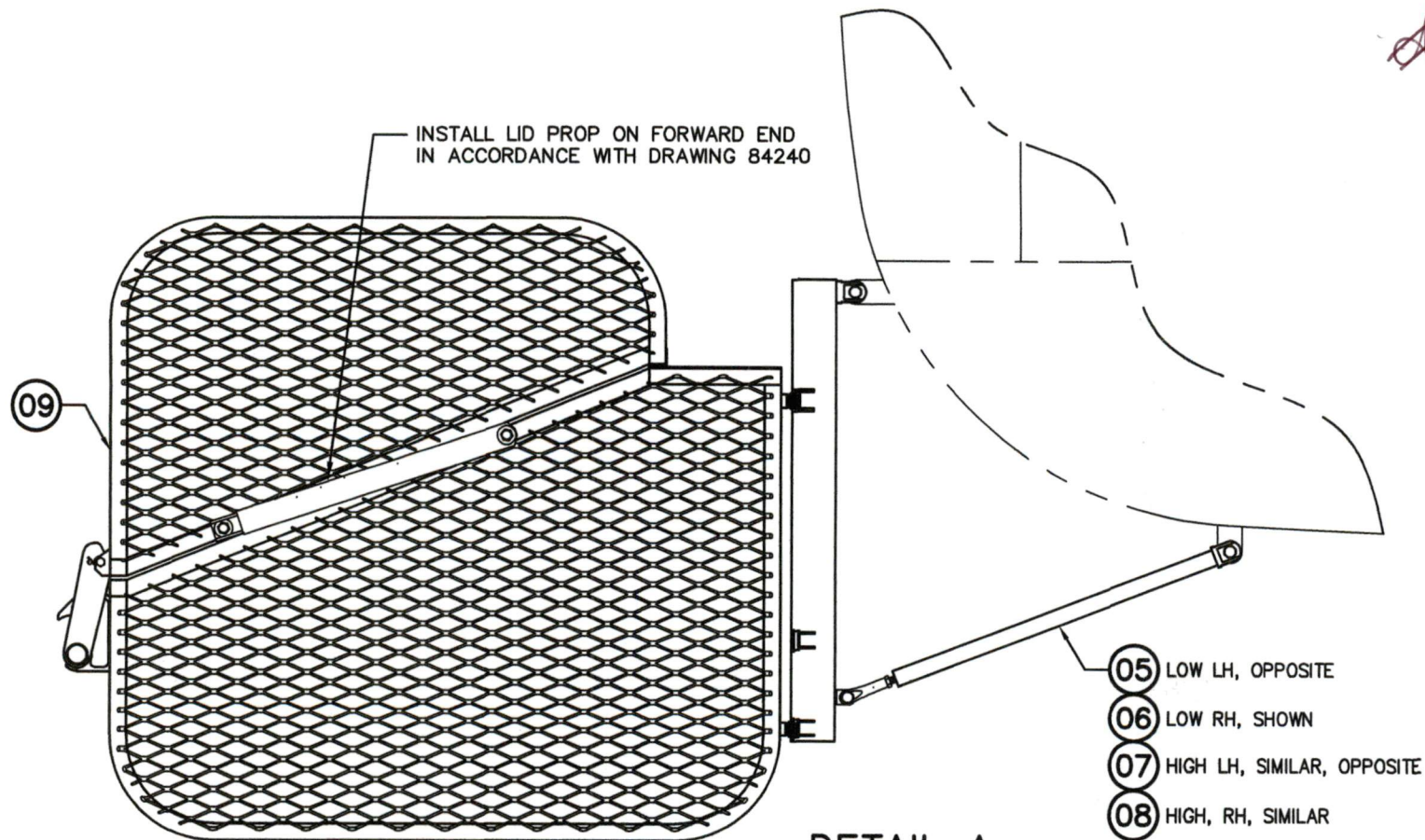


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BELL 205, 212, 214, 412 SERIES
 QUICK RELEASE CARGO BASKET
 INSTALLATION - EXTENDED LID

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.	CHG.
SHEET 1 OF 3	A4	100602	0	A




DETAIL A

NOT TO SCALE
LOOKING AFT AT FORWARD END
RIGHT SIDE SHOWN, LEFT SIDE OPPOSITE

R.B.L.
64.7 INCHES

R.B.L.
1643 mm

W+B #?

APPROVALS		DATE			AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.489.2376 www.aerodesign.ca	
DRAWN: JEFF CLARKE		24 NOV 2014				
CHECKED: JASON REKVE		27 Nov 14				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2' X.XX ±0.03 X.X ±0.1				BELL 205, 212, 214, 412 SERIES QUICK RELEASE CARGO BASKET INSTALLATION – EXTENDED LID		
NOT TO SCALE		DWG. SIZE	DWG. NO.	REV.	CHG.	
SHEET 2 OF 3		A4	100602	0	A	

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE	*	*

NOTES

1. QUICK RELEASE MOUNTING PROVISIONS INSTALLED IN ACCORDANCE WITH DRAWING 100605 OR 100606 IS A MANDATORY PREREQUISITE FOR THIS INSTALLATION.
2. REFER TO FLIGHT MANUAL SUPPLEMENT, FMS751.91, FOR LIMITATIONS WITH THE QUICK RELEASE CARGO BASKET INSTALLED.
3. REFER TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS, ICA751.90, FOR MAINTENANCE INFORMATION.
4. LATERAL ARMS IN THE WEIGHT AND BALANCE ARE FOR RIGHT SIDE INSTALLATION. LEFT SIDE INSTALLATION ARMS ARE NEGATIVE.
5. INSTALLATION PROCEDURE:
 - A) LIFT FORWARD END OF BASKET TO HELICOPTER, ENGAGE UPPER FORWARD LUG IN UPPER HOOK IN FORWARD BEAM.
 - B) LIFT AFT END OF BASKET, ENGAGE LOWER FORWARD ATTACHMENT IN LOWER SLOT IN FORWARD BEAM.
 - C) ENGAGE AFT FITTINGS IN KEYWAYS IN AFT BEAM, PUSH BASKET DOWN.
 - D) RETAINING PIN IN LOWER KEYWAY WILL SPRING INTO PLACE WITH A SNAP.

WEIGHT AND BALANCE — METRIC

ITEM	DESCRIPTION	WEIGHT (kg)	LONGITUDINAL		LATERAL	
			ARM (mm)	MOMENT (mm-kg)	ARM (mm)	MOMENT (mm-kg)
05/06	ATTACH PROVISIONS, LOW	5.1	3064	15567	1164	5915
09	BASKET ASSEMBLY (EXT. LID)	48.6	3073	149445	1656	80515
01/02	LOW BASKET INSTALLATION	53.7	3073	165012	1609	86430
07/08	ATTACH PROVISIONS, HIGH	5.3	3150	16575	1165	6131
09	BASKET ASSEMBLY (EXT. LID)	48.6	3081	149827	1656	80515
03/04	HIGH BASKET INSTALLATION	53.9	3088	166402	1608	86646

WEIGHT AND BALANCE — STANDARD

ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
05/06	ATTACH PROVISIONS, LOW	11.2	120.64	1351.2	45.84	513.4
09	BASKET ASSEMBLY (EXT. LID)	107.2	121.00	12971.2	65.19	6988.4
01/02	LOW BASKET INSTALLATION	118.4	120.97	14322.4	63.36	7501.8
07/08	ATTACH PROVISIONS, HIGH	11.6	124.02	1438.6	45.88	532.2
09	BASKET ASSEMBLY (EXT. LID)	107.2	121.31	13004.4	65.19	6988.4
03/04	HIGH BASKET INSTALLATION	118.8	121.57	14443.1	63.30	7520.6

APPROVALS	DATE
DRAWN: JEFF CLARKE	24 NOV 2014
CHECKED: JASON REKVE	27 Nov 14

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2°
X.XX ±0.03
X.X ±0.1

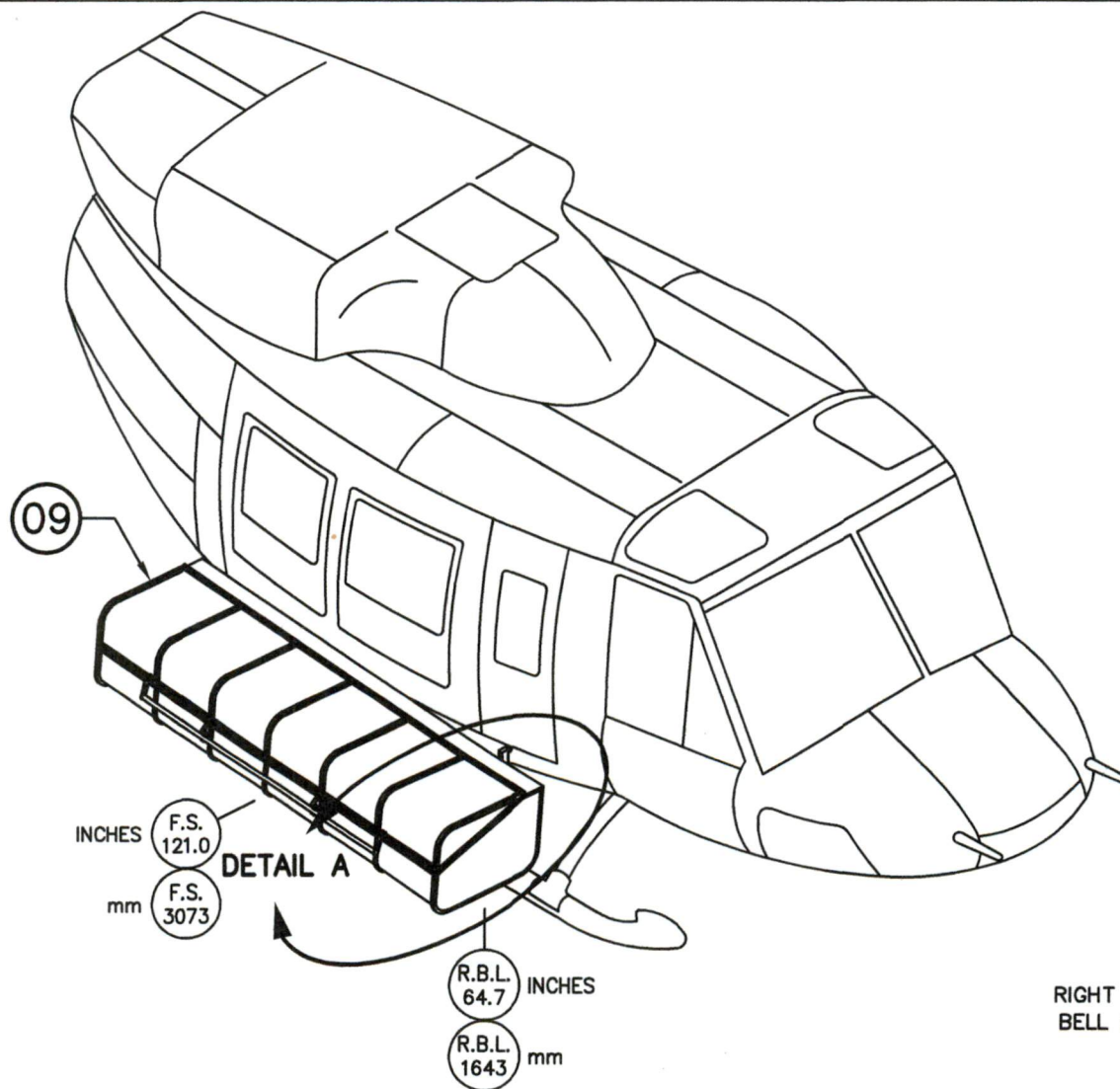


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TEL: 604.489.2376 www.aerodesign.ca

BELL 205, 212, 214, 412 SERIES
QUICK RELEASE CARGO BASKET
INSTALLATION — EXTENDED LID

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.	CHG.
SHEET 3 OF 3	A4	100602	0	A



- 04 INSTALLATION, HIGH RH
 03 INSTALLATION, HIGH LH
 02 INSTALLATION, LOW RH
 01 INSTALLATION, LOW LH

RIGHT SIDE INSTALLATION SHOWN, LEFT SIDE INSTALLATION OPPOSITE
 BELL 212 SHOWN; BELL 205, 214 AND 412 INSTALLATION IDENTICAL
 NOT TO SCALE

1	1	1	1	100610-01	09	CARGO BASKET ASSEMBLY - STANDARD LID
1				100606-01-02	08	EXTERNAL ATTACHMENT PROVISIONS, HIGH, RH
	1			100606-01-01	07	EXTERNAL ATTACHMENT PROVISIONS, HIGH, LH
		1		100605-01-02	06	EXTERNAL ATTACHMENT PROVISIONS, LOW, RH
			1	100605-01-01	05	EXTERNAL ATTACHMENT PROVISIONS, LOW, LH
				100601-02-02	04	BASKET INSTALLATION, HIGH, RH
				100601-02-01	03	BASKET INSTALLATION, HIGH, LH
				100601-01-02	02	BASKET INSTALLATION, LOW, RH
				100601-01-01	01	BASKET INSTALLATION, LOW, LH
04	03	02	01	PART NO.	ITEM	DESCRIPTION
QTY	QTY	QTY	QTY	LIST OF MATERIALS		

APPROVALS	DATE
DRAWN: JEFF CLARKE	24 NOV 2014
CHECKED: JASON REKVE	27 NOV 14

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES.
 TOLERANCES ON:
 DECIMALS ANGLES
 X.XXX ±0.010 ±1/2°
 X.XX ±0.03
 X.X ±0.1

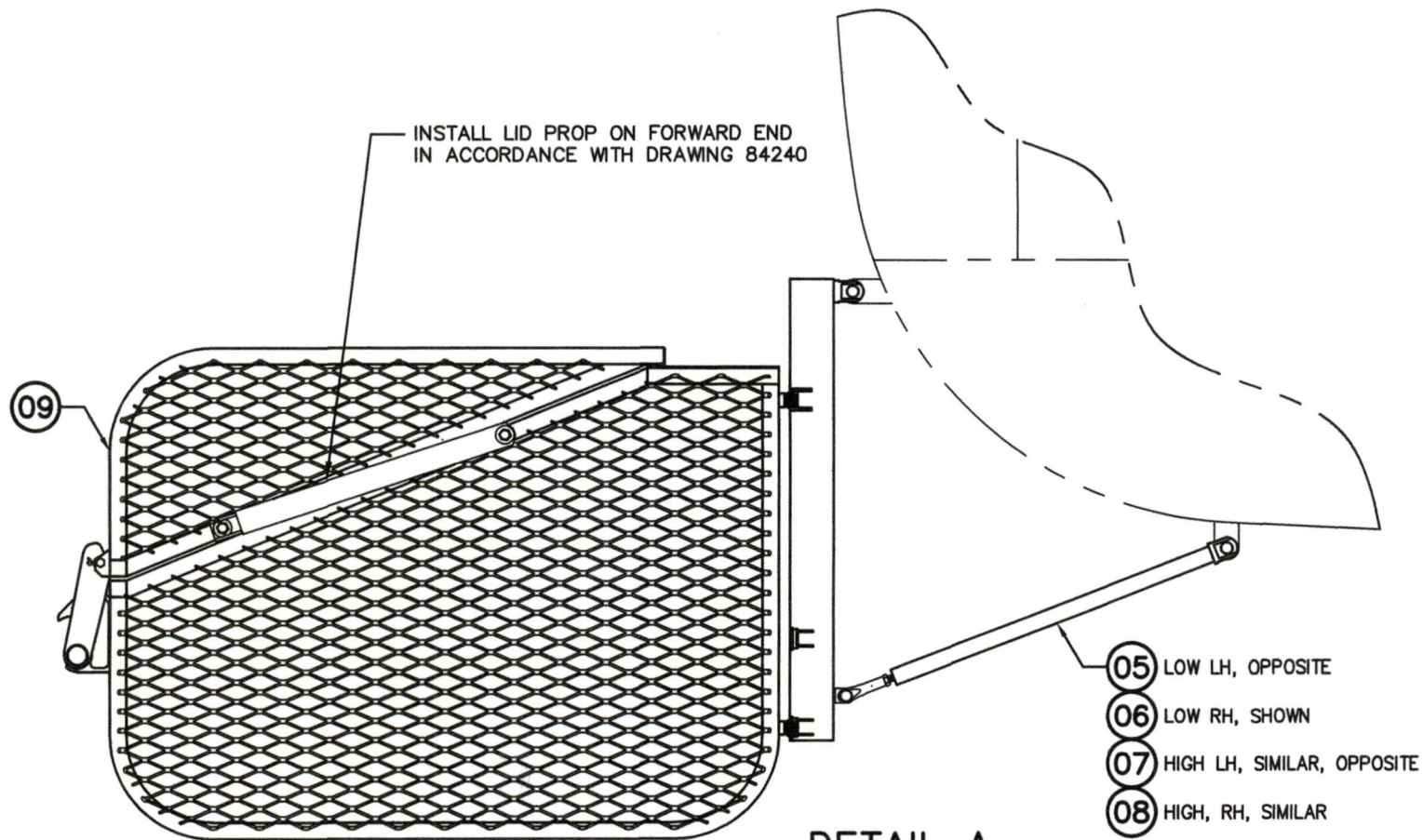


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BELL 205, 212, 214, 412 SERIES
 QUICK RELEASE CARGO BASKET
 INSTALLATION - STANDARD LID

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.	CHG.
SHEET 1 OF 3	A4	100601	0	A




DETAIL A

NOT TO SCALE
LOOKING AFT AT FORWARD END
RIGHT SIDE SHOWN, LEFT SIDE OPPOSITE

R.B.L.
64.7 INCHES
R.B.L.
1643 mm

W+B # Gooey

APPROVALS		DATE			AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.483.2376 www.aerodesign.ca	
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CHECKED: JASON REKVE		27 Nov 14				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1				BELL 205, 212, 214, 412 SERIES QUICK RELEASE CARGO BASKET INSTALLATION – STANDARD LID		
NOT TO SCALE		DWG. SIZE	DWG. NO.	REV.	CHG.	
SHEET 2 OF 3		A4	100601	0	A	

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE	*	*

NOTES

1. QUICK RELEASE MOUNTING PROVISIONS INSTALLED IN ACCORDANCE WITH DRAWING 100605 OR 100606 IS A MANDATORY PREREQUISITE FOR THIS INSTALLATION.
2. REFER TO FLIGHT MANUAL SUPPLEMENT, FMS751.91, FOR LIMITATIONS WITH THE QUICK RELEASE CARGO BASKET INSTALLED.
3. REFER TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS, ICA751.90, FOR MAINTENANCE INFORMATION.
4. LATERAL ARMS IN THE WEIGHT AND BALANCE ARE FOR RIGHT SIDE INSTALLATION. LEFT SIDE INSTALLATION ARMS ARE NEGATIVE.
5. INSTALLATION PROCEDURE:
 - A) LIFT FORWARD END OF BASKET TO HELICOPTER, ENGAGE UPPER FORWARD LUG IN UPPER HOOK IN FORWARD BEAM.
 - B) LIFT AFT END OF BASKET, ENGAGE LOWER FORWARD ATTACHMENT IN LOWER SLOT IN FORWARD BEAM.
 - C) ENGAGE AFT FITTINGS IN KEYWAYS IN AFT BEAM, PUSH BASKET DOWN.
 - D) RETAINING PIN IN LOWER KEYWAY WILL SPRING INTO PLACE WITH A SNAP.

WEIGHT AND BALANCE — METRIC

ITEM	DESCRIPTION	WEIGHT (kg)	LONGITUDINAL		LATERAL	
			ARM (mm)	MOMENT (mm-kg)	ARM (mm)	MOMENT (mm-kg)
05/06	ATTACH PROVISIONS, LOW	5.1	3064	15567	1164	5915
09	BASKET ASSEMBLY	45.4	3073	139407	1643	74531
01/02	LOW BASKET INSTALLATION	50.4	3072	154974	1595	80446
07/08	ATTACH PROVISIONS, HIGH	5.3	3150	16574	1165	6131
09	BASKET ASSEMBLY	45.4	3081	139764	1643	74531
03/04	HIGH BASKET INSTALLATION	50.6	3088	156339	1593	80663

WEIGHT AND BALANCE — STANDARD

ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
05/06	ATTACH PROVISIONS, LOW	11.2	120.64	1351.2	45.84	513.4
09	BASKET ASSEMBLY	100.0	121.00	12100.0	64.69	6469.0
01/02	LOW BASKET INSTALLATION	111.2	120.96	13451.2	62.79	6982.4
07/08	ATTACH PROVISIONS, HIGH	11.6	124.02	1438.6	45.88	532.2
09	BASKET ASSEMBLY	100.0	121.31	12131.0	64.69	6469.0
03/04	HIGH BASKET INSTALLATION	111.6	121.59	13569.6	62.73	7001.2

APPROVALS	DATE
DRAWN: JEFF CLARKE	24 NOV 2014
CHECKED: JASON REKVE	27 Nov 14

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2°
X.XX ±0.03
X.X ±0.1



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BELL 205, 212, 214, 412 SERIES
QUICK RELEASE CARGO BASKET
INSTALLATION — STANDARD LID

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.	CHG.
SHEET 3 OF 3	A4	100601	0	A

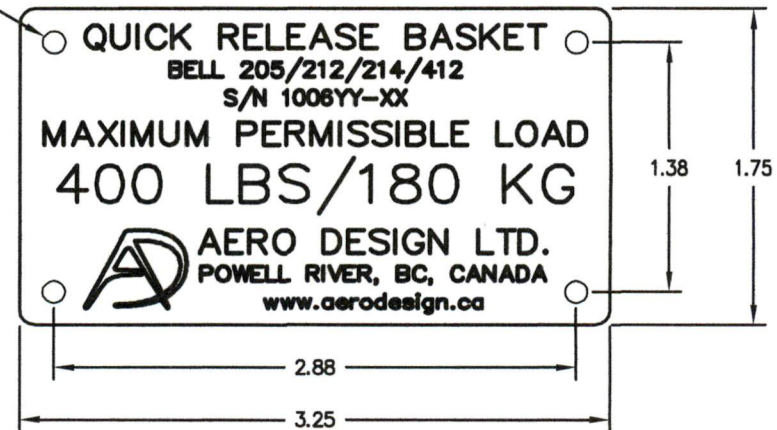
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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE	*	*


NOTES

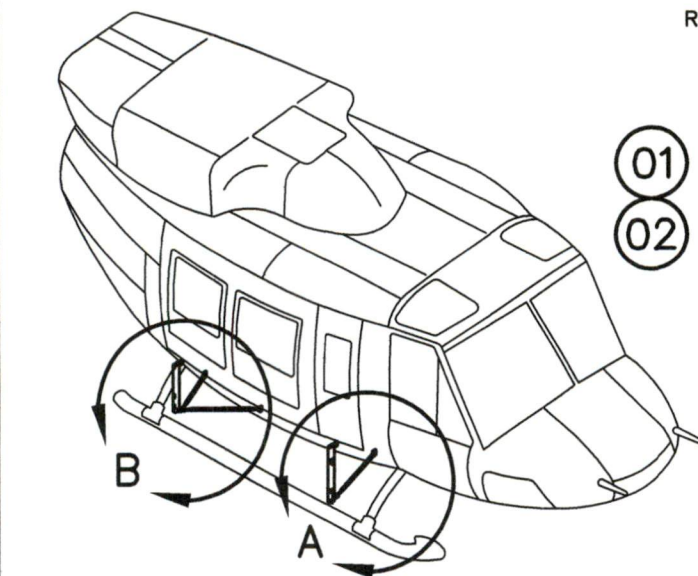
- ENGRAVE 0.007 DEEP AS FOLLOWS:
 "QUICK RELEASE BASKET" - 0.125 HIGH
 "BELL 205/212/214/412" - 0.080 HIGH
 "S/N 1006YY-XX" - 0.080 HIGH - (SEE NOTES 2-3)
 "MAXIMUM PERMISSIBLE LOAD" - 0.125 HIGH
 "400 LBS/180 KG" - 0.200 HIGH
 "AERO DESIGN LTD." - 0.125 HIGH
 "POWELL RIVER, BC, CANADA" - 0.080 HIGH
 "www.aerodesign.ca" - 0.080 HIGH
- ITEM 01: BASKET WITH STANDARD LID TO READ:
 "S/N 100601-XX" - 0.080 HIGH
- ITEM 02: BASKET WITH EXTENDED LID TO READ:
 "S/N 100602-XX" - 0.080 HIGH

DRILL #30 (0.129)
4 PLACES

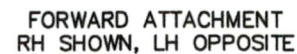


(01)(02) PLACARD


1	100627-02	02	PLACARD (EXTENDED LID)	6061-T6 ALUMINUM	QQ-A-250/11	0.050 SHEET
1	100627-01	01	PLACARD (STANDARD LID)	6061-T6 ALUMINUM	QQ-A-250/11	0.050 SHEET
	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	LIST OF MATERIALS					
	APPROVALS		DATE	 <div>AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.483.2376 www.aerodesign.ca</div>		
	DRAWN:	JEFF CLARKE	26 NOV 2014			
	CHECKED:	JASON REKVE	27 NOV 2014			
	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1			BELL 205, 212, 214, 412 SERIES QUICK RELEASE MEGA CARGO BASKET PLACARD		
	SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.	CHG.
SHEET 1 OF 1		A1	100627	0	A	

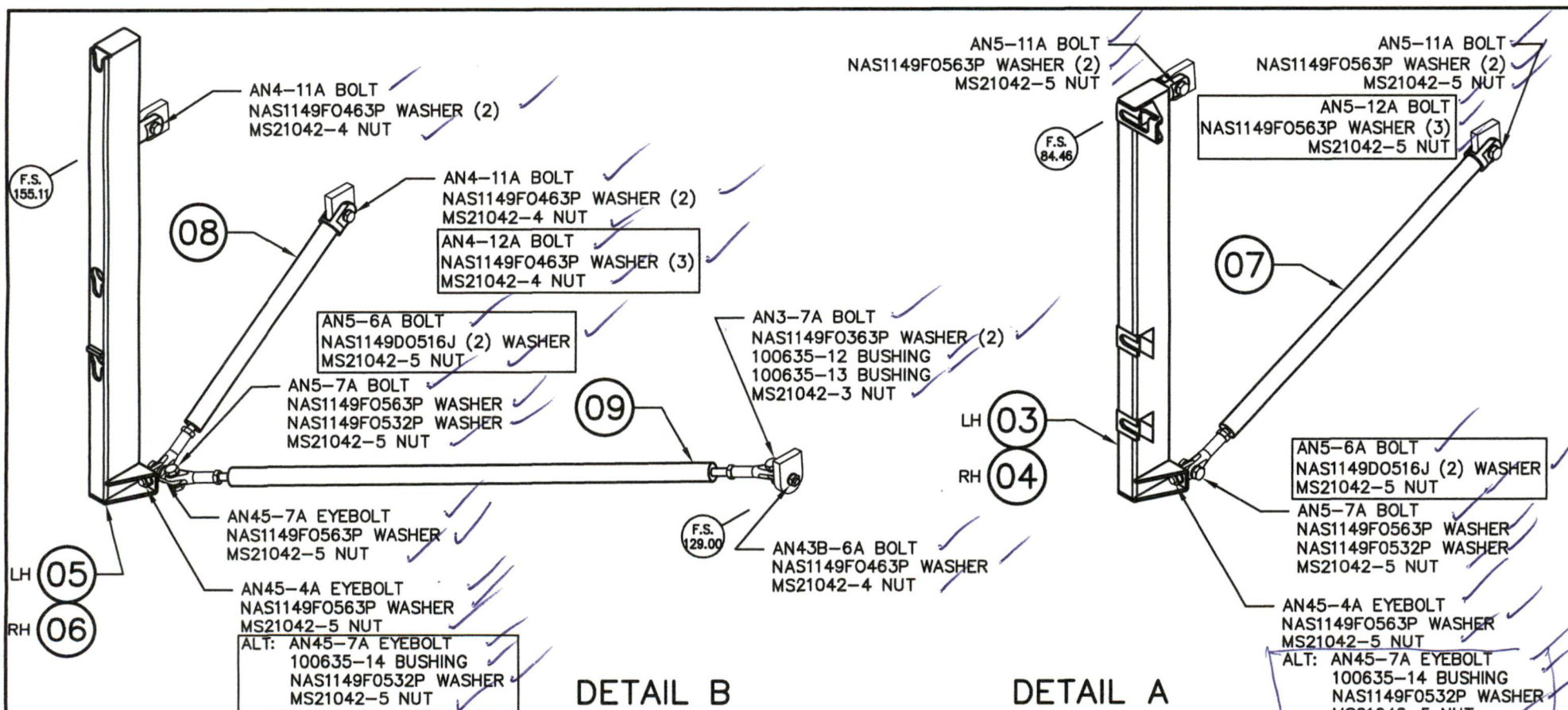


AFT ATTACHMENT
RH SHOWN, LH OPPOSITE



- ① EXTERNAL ATTACH. PROVISIONS, LOW MOUNTED, LH
② EXTERNAL ATTACH. PROVISIONS, LOW MOUNTED, RH

APPROVALS		DATE			AERO DESIGN LTD.			
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					TEL: 604.488.2376		www.aerodesign.ca	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:				BELL 205, 212, 214, 412 SERIES EXTERNAL ATTACHMENT PROVISIONS LOW MOUNTED INSTALLATION				
DECIMALS		ANGLES						
X.XXX ±0.010		±1/2"						
X.XX ±0.03								
X.X ±0.1								
NOT TO SCALE				DWG. SIZE	DWG. NO.	REV.	CHG.	
SHEET 1 OF 2				A4	100605	0	PD	



APPROVALS		DATE		AERO DESIGN LTD.	
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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:				BELL 205, 212, 214, 412 SERIES EXTERNAL ATTACHMENT PROVISIONS HIGH MOUNTED INSTALLATION	
DECIMALS		ANGLES		NOT TO SCALE	DWG. NO.
X.XXX ±0.010		±1/2°		DWG. SIZE	REV.
X.XX ±0.03					CHG.
X.X ±0.1				SHEET 1 OF 2	
				A4	100606
				0	PD

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-4 TRANSPORT CATEGORY ROTORCRAFT – CAR 529

BLOCK 1

Name of the applicant for the design change approval:	Aero Design Ltd.
Description of the design change:	Installation of Mounting Provisions and Quick Release Cargo Basket on Bell 205/212/214/412
Certification Basis of design change and revision date:	FAR 29, Amendment 29-2
CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed:	Section 0-3 of Supplemental ICA (ICA 751.90, Rev. 2)
CAR Standard 513.05 (1) (g) (iv): Installation Instructions:	Installation Drawing 75101, 75103, 95501, 95502, 100601, 100602, 100605, 100606

BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.	ICA ref: Bell 205/212/214/412 Maintenance Manuals BHT-205A1-MM-1 BHT-212-MM BHT-214B-MM-1 BHT-412-MM	Supplemental ICA ref: Single Manual (ICA751.90, Rev. 2)
A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement.	ICA ref: Bell 205/212/214/412 Maintenance Manual	Supplemental ICA ref: Arranged in ATA format
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (a) Rotorcraft maintenance manual or section		
A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance.	ICA ref: Bell 205/212/214/412 Maintenance Manual Chapter 1	Supplemental ICA ref: Section 0-1

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances.	ICA ref: Bell 205/212/214/412 Maintenance Manual Chapter 1	Supplemental ICA ref: Section 0-5
A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 12	Supplemental ICA ref: N/A
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (b) Maintenance Instructions.		
A527.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 25	Supplemental ICA ref: Section 25-1 thru 25-12
A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 7 and 8	Supplemental ICA ref: Section 25-14
A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3	Supplemental ICA ref: Section 5-3
A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2	Supplemental ICA ref: Section 25-15
A527.3 (g) Special tools (g) A list of special tools needed.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3

Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

A529.4 AWL - Separate Section 1 The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under <u>529.571</u> . If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."	ICA ref: Bell 205/212/214/412 Maintenance Manual, Chapter 4	Supplemental ICA ref: Chapter 4
---	--	---------------------------------

BLOCK 4 – Applicant Statement of Compliance

The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.

Applicants Signature: Jeff Clarke Date: 19 December 2014

Applicants Name: Jeff Clarke, Vice President

BLOCK 5 – Minister's Statement of Acceptability

The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.

Reviewer's Name: _____ Phone # _____ Email: _____ Mail Routing Symbol: _____

Signature: _____ Date: _____ NAPA Number: _____

FLIGHT TEST PLAN

FTP1006.03

BELL 205/212/214/412

QUICK RELEASE CARGO BASKET

Prepared by: J. Clarke, P.Tech.(Eng.)

Revision 0, 18 December 2014

Aero Design Ltd.



9888A Malaspina Road, Powell River, BC, V8A 0G3

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1.0 INTRODUCTION

The Quick Release Cargo Basket is mounted on the right or left side of the helicopter. The basket is made from steel tubing and expanded steel mesh. It is quickly detachable from the mounting beams that support it.

2.0 REFERENCE TEXT

Aero Design Ltd. Installation Drawings

100602, Revision 0 – Cargo Basket Installation (Extended Lid)

100605, Revision 0 – Quick Release Mounting Provisions Installation (Low Mounted)

100606, Revision 0 – Quick Release Mounting Provisions Installation (High Mounted)

Aero Design Ltd. Flight Manual Supplement FMS751.91, Rev. 2 (draft)

BHT-205A1-FM-1thru -3 – Bell 205A-1 Rotorcraft Flight Manual

BHT-212VFR-FM-1 – Bell 212 Rotorcraft Flight Manual

BHT-214B-FM-1 – Bell 214B Rotorcraft Flight Manual

BHT-214B1-FM-1 – Bell 214B-1 Rotorcraft Flight Manual

BHT-412-FM-1 thru -4 – Bell 412 Rotorcraft Flight Manual

3.0 FLIGHT TEST OBJECTIVE

Flight testing of the Quick Release Cargo Basket is meant to demonstrate that the installation is free of excessive vibration at speeds from hover thru to V_d , and does not produce undesirable effects to the handling and performance qualities of the helicopter.

This flight testing is in advance of flight testing by Transport Canada Flight Test Division in support of obtaining a Supplemental Type Certificate.

4.0 TEST PREPARATION

4.1 Instrument Calibration

The maintenance records of the test helicopter will be checked to ensure the airspeed indicator has been calibrated within the specified time period.

4.2 Equipment

The helicopter will be fitted with the Low Quick Release Mounting Provisions on the left hand side in accordance with drawing 100605.

The helicopter will be fitted with the High Quick Release Mounting Provisions on the right hand side in accordance with drawing 100606.

The helicopter will be fitted with the Quick Release Cargo Basket with Extended Lid Installation in accordance with drawing 100602.

4.3 Flight Test Crew

Two crew members will be required for the test:

- 1) Pilot with training and experience appropriate to the task of testing this equipment.
- 2) Test observer, either a DAR or a qualified alternate appointed by him, beside the pilot.

All members of the crew will be equipped to communicate via intercom.

Seating arrangement of the observer(s) may be limited by loading requirements.

4.4 Documents

These test flights require a FLIGHT PERMIT issued by Transport Canada. Flight permit must allow flight to 1.11 Vne.

The draft Flight Manual Supplement, FMS751.91 Revision 2, shall be on board the aircraft.

The Pilot will familiarize himself with the contents of this Test Plan and the Flight Manual Supplement prior to flight.

4.5 Weight and Balance

The helicopter will be loaded with sufficient fuel and ballast to produce the following conditions for flight:

- A) Helicopter un-modified*, with weight and balance within limits specified in the flight manual
- B) Cargo Basket configuration 100602-02-02 (high mounted with extended lid) installed on the right hand side, basket loaded with 400 lbs.
- C) Cargo Basket configuration 100602-01-01 (low mounted with extended lid) installed on the left hand side, basket loaded with 400 lbs.

*Note: Quick Release Mounting Provisions may be installed.

C of G must remain within the limits specified in the Flight Manual.

Loading information specific to the Quick Release Cargo Basket is contained in the Flight Manual Supplement, FMS751.91. The basket will be loaded to 400 lbs, secured to prevent shifting in flight.

5.0 FLIGHT TESTS

One flight is required for each of the conditions listed in 4.5 above.

The flights are to be conducted as follows:

Take off and establish cruise at 50 kts. Increase speed in 10 kt increments up to Vne. Recover from Vne, then accelerate to Vd ($1.1 \times Vne$).

Vne as follows, refer to Flight Manual:

Bell 205A-1

GW	Up to 7500 lbs	7500 to 8500 lbs	over 8500 lbs
Vne =	120 KCAS	115 KCAS	110 KCAS

Vne at sea level to 3000 ft, reduce by 3 knots per 1000 feet.

Bell 212

GW	Up to 7500 lbs	11200 lbs
Vne =	130 KIAS	100 KIAS (decrease linearly from 7500 lbs to 11200 lbs)

Vne at sea level to 3000 ft, reduce by 3 knots per 1000 feet.

Bell 214B / B-1

Vne = 140 KIAS refer to placard for reductions with altitude and temperature

Bell 412

Vne = 140 KIAS refer to placard for reductions with altitude and temperature

Flight testing performed by a Transport Canada Flight Test Division Pilot may deviate from this test plan at the discretion of the test pilot in order to complete a Transport Canada prepared flight test report.

6.0 RECORDING OF RESULTS – BELL 205/212

Model: Bell 205A-1

Serial Number: 30023

Registration: C-GWWP

Gross Weight: 7500 lb

A complete flight test program was performed by TCCA flight test pilot Michel Brulotte on 14 November 2014 on a Bell 212, see flight test report prepared by Mr. Brulotte.

This flight testing is performed in order to increase the allowable cargo load following successful load testing of the mounting provisions in accordance with the FURTHER TESTING requirements of the flight test report prepared by Mr. Brulotte.

Results:

<p>LH Ascent to fly. <i>OK</i> <i>OK</i> <i>OK</i> <i>OK</i> See note <i>OK</i></p>	<p>Hover and Low Speed controllability at speeds up to 20 knots – Ensure adequate control margins. <i>RH OK</i></p> <p>Controllability in climb at power up to Take-off power – Ensure adequate control margins. <i>OK</i></p> <p>Controllability at V_{NE}, including turns of up to 30 degrees of bank left and right – Ensure adequate control margins. <i>OK</i></p> <p>Flight at V_D (127 KIAS) – Ensure no objectionable vibrations. <i>OK</i></p> <p>Controllability in autorotation, including entry – Ensure adequate control margins. <i>OK</i></p> <p>If Aerodesign decides to expand the V_{NE} envelope beyond 114 KIAS for the basket then it is recommended that a qualified test pilot conduct the tests.</p>
---	---

Note: Left side install - Right cyclic in auto - still within limits
* Bubble & left side

Flight test - Completed and found OK.
Trest Lamb
CH366620 -

7.0 RECORDING OF RESULTS – BELL 214B / B-1Model: Bell 214B

Serial Number: _____

Registration: _____

Gross Weight: _____

Check (✓) if acceptable. Record Vne/Vd achieved.

Bell 214	Airspeed (KIAS)										
Configuration	50	60	70	80	90	100	110	120	130	Vne (140)	Vd (156)
Un-modified											
100602-XX-01 Basket (RH)											
100602-XX-01 Basket (LH)											

Observations:

Flight test performed by:

Date:

8.0 RECORDING OF RESULTS – BELL 412Model: Bell 412

Serial Number: _____

Registration: _____

Gross Weight: _____

Check (✓) if acceptable. Record Vne/Vd achieved.

Bell 412	Airspeed (KIAS)										
Configuration	50	60	70	80	90	100	110	120	130	Vne (140)	Vd (156)
Un-modified											
100602-XX-01 Basket (RH)											
100602-XX-01 Basket (LH)											

Observations:

Flight test performed by:

Date:

18 DEC 2014⁴

RECOMMENDATIONS

Based on flight test results the Aero Design Basket modification is recommended for approval on B205, and B212 aircraft with the following limitations:

VFR Only

Only one basket be installed on the aircraft, on either the left or right side.

Maximum V_{NE} is 114 KIAS, or basic aircraft V_{NE} , whichever is lowest.

Maximum load in the basket is 267 lbs.

Operating Procedures

The crew should ensure that the load is secured in the basket and that the basket is securely closed prior to flight.

The following performance information must be included in the Flight Manual Supplement:

Cruise performance, and range will be reduced by approximately 10 percent with the Basket installed.

Climb performance will be reduced by 250 fpm.

FURTHER TESTING

If Aerodesign decides to expand the basket cargo weight limit after successful completion of the basket structural tests then the following flight tests must be completed:

Hover and Low Speed controllability at speeds up to 20 knots – Ensure adequate control margins. RH, OK

Controllability in climb at power up to Take-off power – Ensure adequate control margins. OK

Controllability at V_{NE} , including turns of up to 30 degrees of bank left and right – Ensure adequate control margins. OK

Flight at V_D (127 KIAS) – Ensure no objectionable vibrations. OK

Controllability in autorotation, including entry – Ensure adequate control margins. OK

If Aerodesign decides to expand the V_{NE} envelope beyond 114 KIAS for the basket then it is recommended that a qualified test pilot conduct the tests.

Note: Left side install - Right cyclic in auto - still within limits
* Bubble at left side

Flight test - Completed and found OK.

Trent Lamb
CH 366620 -

CONFORMITY INSPECTION RECORD – Flight Test Installation

Applicant	Aeronautical Product				Title of Change
Aero Design Ltd.	Make		Model	Serial No.	Cargo Basket Installation (1006 Configuration)
	Bell		205A-1	30023	
				C-GWWP	
Drawing No.	Applicant's Inspector		T.C. Inspection		Findings
	Signature	Date	Signature	Date	
100602, Rev. 0A 100602-01-01 (Basket Installation Extended Lid, LH Low Mounted)	[Signature] M795441	18 Dec 14			
100602, Rev. 0A 100602-02-02 (Basket Installation Extended Lid, RH High Mounted)	[Signature] M795441	18 Dec 14			
100605, Rev. 0PD1 100605-01-01 (Provisions Install'n, LH Low Mounted)	[Signature] M795441	18 Dec 14			
100606, Rev. 0PD1 100606-01-02 (Provisions Install'n, RH High Mounted)	[Signature] M795441	18 Dec 14			

CONFORMITY INSPECTION RECORD – Flight Test Installation

APPLICANT'S ATTESTATION

I hereby confirm that the prototype installation for the subject

☒ MODIFICATION,

☐ REPAIR,

☐ TSO/AP-TC ARTICLE

is in conformity with the applicable installation drawing(s) listed above
and that necessary ground tests have been carried out.

[Please check (✓) the applicable box.]

Additional Information:

Drawings 100605 Rev. 0 PD1 and 1006 Rev. 0 PD1 are prototype disposition drawings showing the deviations from drawings 100605 Rev. 0 Chg. B and 100606 Rev. 0 Chg. B, as installed on the helicopter in advance of flight testing. The deviations are the use of different lengths of bolts than specified, and the corresponding number and/or thickness of washers required to set the nuts used on the bolts in safety.

Signature: _____

Asa Behm 11795411

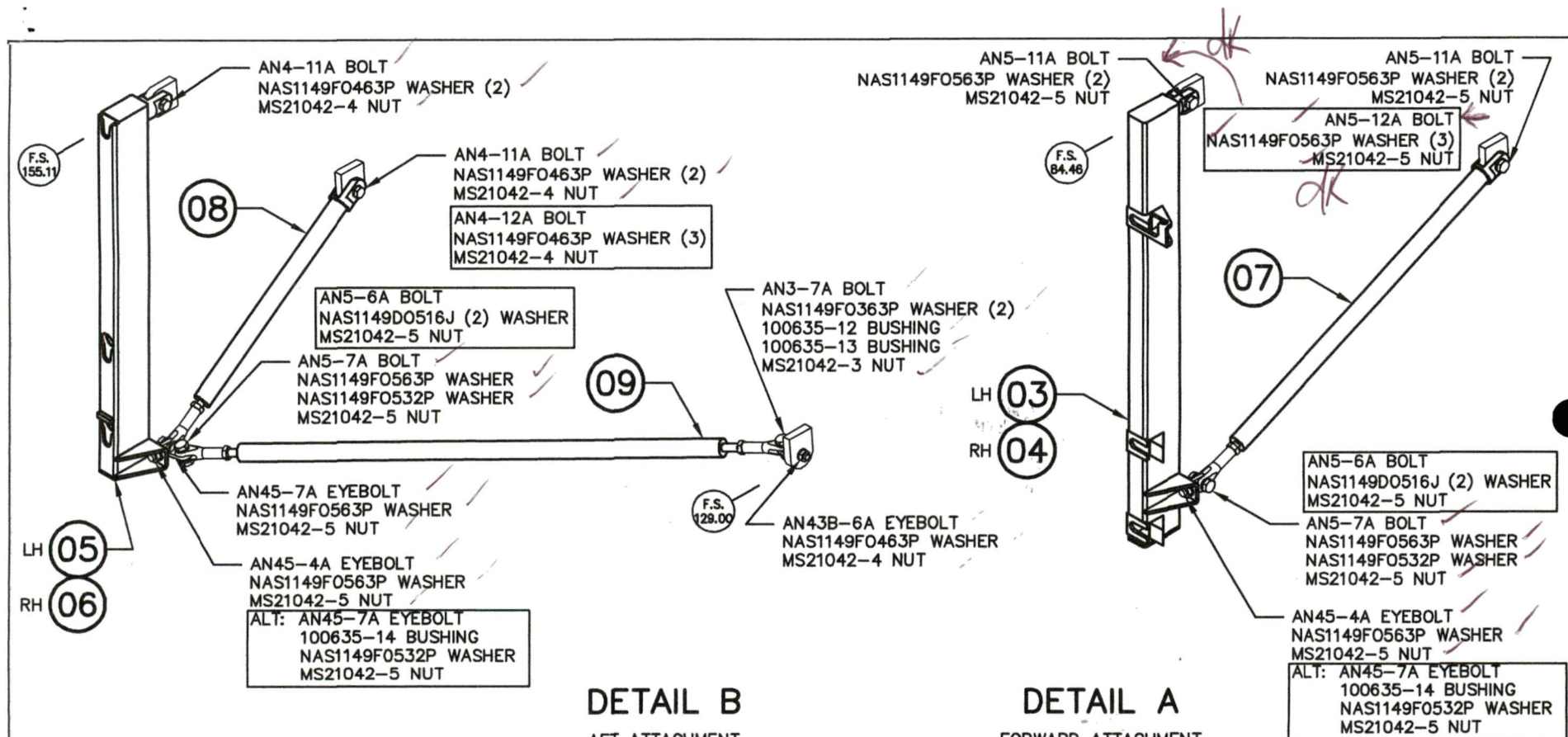
TC INSPECTION

☐ ACCEPTABLE

☐ UNACCEPTABLE

Remarks:

Signature: _____



DETAIL B

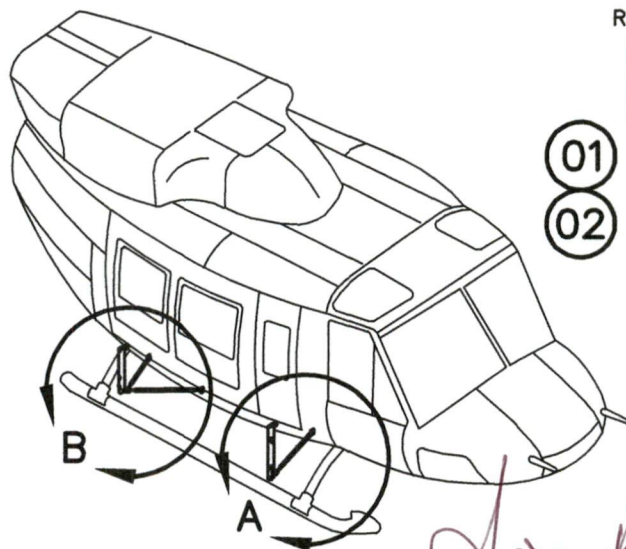
AFT ATTACHMENT
RH SHOWN, LH OPPOSITE

DETAIL A


FORWARD ATTACHMENT
RH SHOWN, LH OPPOSITE

THIS DRAWING SHOWS THE PROTOTYPE DISPOSITION (PD) FOR THE INSTALLATION CONFORMITY INSPECTED BY TRANSPORT CANADA ON 13 NOV 2014. DEVIATIONS FROM THE INTENDED APPROVED INSTALLATION DRAWING 100605, REV. 0 CHG. B ARE INDICATED WITH A BOX.

- 01 EXTERNAL ATTACH. PROVISIONS, LOW MOUNTED, LH
- 02 EXTERNAL ATTACH. PROVISIONS, LOW MOUNTED, RH



Jason Rehr
M79544

APPROVALS		DATE		 AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G8 TEL: 804.489.8276 www.aerodesign.ca	
DRAWN:	JEFF CLARKE	27 NOV 2014			
CHECKED:	JASON REKVE	27 NOV 2014			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1				BELL 205, 212, 214, 412 SERIES EXTERNAL ATTACHMENT PROVISIONS LOW MOUNTED INSTALLATION	
NOT TO SCALE		DWG. SIZE	DWG. NO.	REV.	CHG.
SHEET 1 OF 2		A4	100605	0	PD1

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE	*	*


NOTES:

- SEE INSTRUCTIONS FOR CONTINUED AIRWORTHINESS, ICA751.90, FOR MAINTENANCE INFORMATION.
- INSTALLATION PROCEDURE:
 - INSTALL FORWARD AND AFT BEAM ON UPPER FUSELAGE HARD POINTS. DO NOT FULLY TIGHTEN BOLTS.
 - INSTALL FORWARD AND AFT STRUTS FROM BEAM TO LOWER FUSELAGE HARD POINTS. DO NOT TIGHTEN BOLTS.
 - ALIGN FORWARD AND AFT BEAMS TO BE PARALLEL WHEN VIEWED FROM THE FRONT OR BACK. THREAD CLEVIS ON STRUTS IN OR OUT TO ADJUST.
 - INSTALL DRAG LINK FROM AFT BEAM TO LOWER FUSELAGE HARD POINT AT FS. 129.00. THREAD CLEVIS ON BOTH ENDS IN OR OUT TO ADJUST.
 - ADJUST DRAG LINK FOR CENTRE TO CENTRE SPACING OF BEAMS TO 71.0 INCHES (1803 mm).
 - TIGHTEN ALL FASTENERS AND CHECK NUTS PER NOTE 3.
- TORQUE FASTENERS AS FOLLOWS:
 - AN3 BOLTS: 12-15 IN-LBS (1.36-1.69 N-m)
 - AN4 BOLTS: 30-40 IN-LBS (3.39-4.52 N-m)
 - AN5 BOLTS, AN316-5 CHECK NUTS: 60-85 IN-LBS (6.78-9.60 N-m)
 - AN43 EYE BOLT: 50-70 IN-LBS (5.65-7.91 N-m)
 - AN45 EYE BOLTS: 100-140 IN-LBS (11.30-15.82 N-m)

1	1	MS21042-3	NUT (ALT: MS21042L3, MS21044N3)
3	3	MS21042-4	NUT (ALT: MS21042L4, MS21044N4)
7	7	MS21042-5	NUT (ALT: MS21042L5, MS21044N5)
2	2	NAS1149F0363P	WASHER
5	5	NAS1149F0463P	WASHER
2	2	NAS1149F0532P	WASHER
9	9	NAS1149F0563P	WASHER
1	1	AN3-7A	BOLT
1	1	AN43B-6A	EYE BOLT
2	2	AN4-11A	BOLT
1	1	AN45-7A	EYE BOLT
2	2	AN45-4A	EYE BOLT (ALT: AN45-7A WITH 100635-14 BUSHING)
2	2	AN5-7A	BOLT
2	2	AN5-11A	BOLT
1	1	100635-04	BUSHING
1	1	100635-03	09 DRAG LINK
1	1	100635-02	08 AFT STRUT
1	1	100635-01	07 FORWARD STRUT
1		100631-01-02	06 AFT BEAM, LOW MOUNTED, RH
	1	100631-01-01	05 AFT BEAM, LOW MOUNTED, LH
1		100630-01-02	04 FORWARD BEAM, LOW MOUNTED, RH
	1	100630-01-01	03 FORWARD BEAM, LOW MOUNTED, LH
		100605-01-02	02 EXTERNAL ATTACHMENT PROVISIONS, LOW MOUNTED, RH
		100605-01-01	01 EXTERNAL ATTACHMENT PROVISIONS, LOW MOUNTED, LH
02	01	PART NO.	ITEM DESCRIPTION
QTY	QTY	LIST OF MATERIALS	

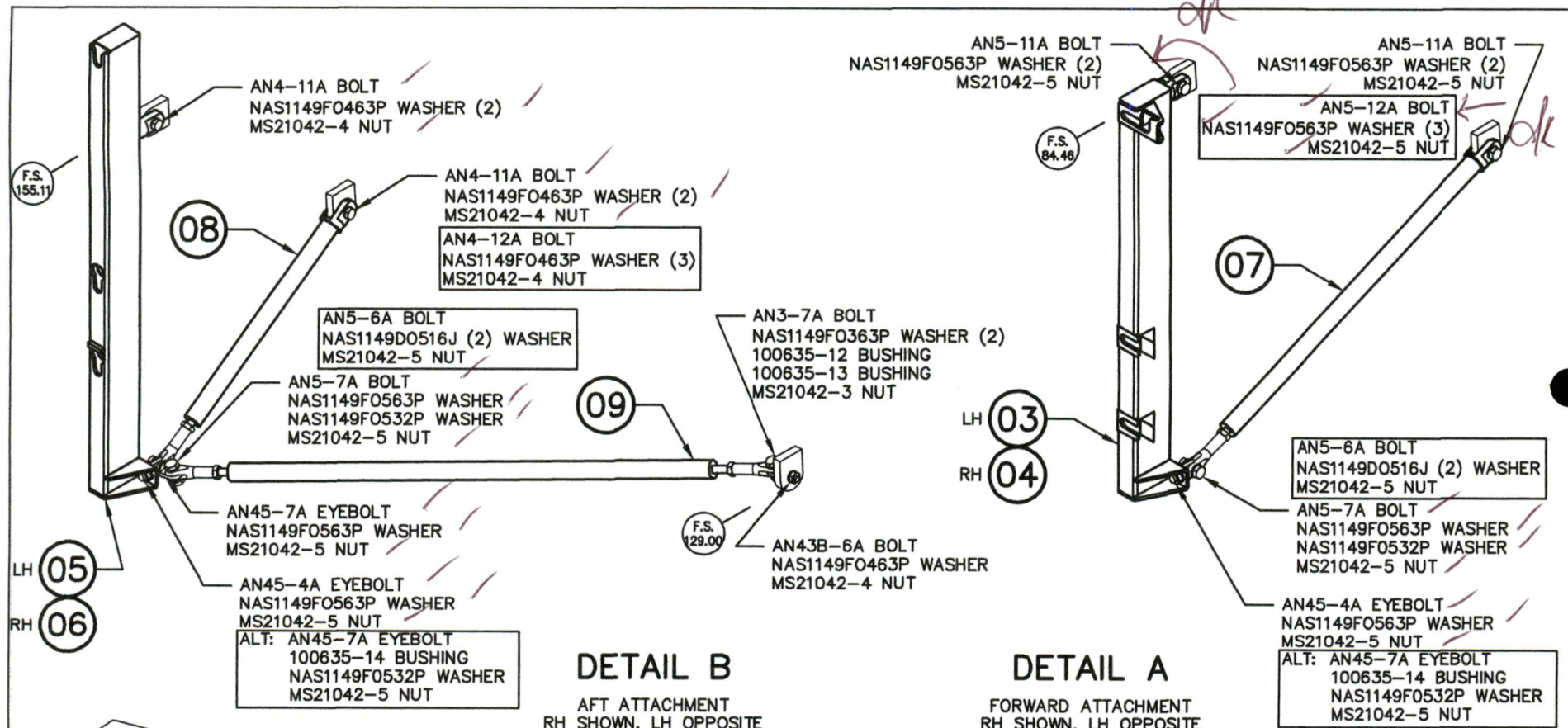
WEIGHT AND BALANCE — METRIC						
ITEM	DESCRIPTION	WEIGHT (kg)	LONGITUDINAL		LATERAL	
			ARM (mm)	MOMENT (mm-kg)	ARM (mm)	MOMENT (mm-kg)
EXTERNAL ATTACHMENT PROVISIONS INSTALLATION						
01	LOW MOUNTED, LH	5.1	3064	15567	-1164	-5915
02	LOW MOUNTED, RH	5.1	3064	15567	1164	5915

WEIGHT AND BALANCE — STANDARD						
ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
EXTERNAL ATTACHMENT PROVISIONS INSTALLATION						
01	LOW MOUNTED, LH	11.2	120.64	1351.2	-45.84	-513.4
02	LOW MOUNTED, RH	11.2	120.64	1351.2	45.84	513.4


APPROVALS		DATE		AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G5 TEL: 604.683.8976 www.aerodesign.ca
DRAWN: JEFF CLARKE		27 NOV 2014		
CHECKED: JASON REKVE		27 NOV 2014		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:		BELL 205, 212, 214, 412 SERIES EXTERNAL ATTACHMENT PROVISIONS LOW MOUNTED INSTALLATION				
DECIMALS		ANGLES				
X.XXX ±0.010		±1/2°				
X.XX ±0.03						
X.X ±0.1						

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.	CHG.
SHEET 2 OF 2	A4	100605	0	PD1



THIS DRAWING SHOWS THE PROTOTYPE DISPOSITION (PD) FOR THE INSTALLATION CONFORMITY INSPECTED BY TRANSPORT CANADA ON 13 NOV 2014. DEVIATIONS FROM THE INTENDED APPROVED INSTALLATION DRAWING 100606, REV. 0 CHG. B, ARE INDICATED WITH A BOX.

APPROVALS		DATE			AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G5 TEL: 604.489.8376 www.aerodesign.ca			
DRAWN: JEFF CLARKE		27 NOV 2014						
CHECKED: JASON REKVE		27 NOV 2014						
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1				BELL 205, 212, 214, 412 SERIES EXTERNAL ATTACHMENT PROVISIONS HIGH MOUNTED INSTALLATION				
NOT TO SCALE		DWG. SIZE	DWG. NO.				REV.	CHG.
SHEET 1 OF 2		A4	100606				0	PD1

Jason Rekve
1795441

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE	*	*

NOTES:

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 - AN4 BOLTS: 30-40 IN-LBS (3.39-4.52 N-m)
 - AN5 BOLTS, AN316-5 CHECK NUTS: 60-85 IN-LBS (6.78-9.60 N-m)
 - AN43 EYE BOLT: 50-70 IN-LBS (5.65-7.91 N-m)
 - AN45 EYE BOLTS: 100-140 IN-LBS (11.30-15.82 N-m)

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3	3	MS21042-4	NUT (ALT: MS21042L4, MS21044N4)
7	7	MS21042-5	NUT (ALT: MS21042L5, MS21044N5)
2	2	NAS1149F0363P	WASHER
5	5	NAS1149F0463P	WASHER
2	2	NAS1149F0532P	WASHER
9	9	NAS1149F0563P	WASHER
1	1	AN3-7A	BOLT
1	1	AN43B-6A	EYE BOLT
2	2	AN4-11A	BOLT
1	1	AN45-7A	EYE BOLT
2	2	AN45-4A	EYE BOLT (ALT: AN45-7A WITH 100635-14 BUSHING)
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2	2	AN5-11A	BOLT
1	1	100635-04	BUSHING
1	1	100635-03	09 DRAG LINK
1	1	100635-02	08 AFT STRUT
1	1	100635-01	07 FORWARD STRUT
1		100633-01-02	06 AFT BEAM, HIGH MOUNTED, RH
	1	100633-01-01	05 AFT BEAM, HIGH MOUNTED, LH
1		100632-01-02	04 FORWARD BEAM, HIGH MOUNTED, RH
	1	100632-01-01	03 FORWARD BEAM, HIGH MOUNTED, LH
		100606-01-02	02 EXTERNAL ATTACHMENT PROVISIONS, HIGH MOUNTED, RH
		100606-01-01	01 EXTERNAL ATTACHMENT PROVISIONS, HIGH MOUNTED, LH
02	01	PART NO.	ITEM DESCRIPTION
QTY	QTY	LIST OF MATERIALS	

WEIGHT AND BALANCE - METRIC

ITEM	DESCRIPTION	WEIGHT (kg)	LONGITUDINAL		LATERAL	
			ARM (mm)	MOMENT (mm-kg)	ARM (mm)	MOMENT (mm-kg)
01	EXTERNAL ATTACHMENT PROVISIONS HIGH MOUNTED, LH	5.3	3150	16575	-1165	-6131
02	HIGH MOUNTED, RH	5.3	3150	16575	1165	6131

WEIGHT AND BALANCE - STANDARD

ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
01	EXTERNAL ATTACHMENT PROVISIONS HIGH MOUNTED, LH	11.6	124.02	1438.6	-45.88	-532.2
02	HIGH MOUNTED, RH	11.6	124.02	1438.6	45.88	532.2

APPROVALS	DATE
DRAWN: JEFF CLARKE	27 NOV 2014
CHECKED: JASON REKVE	27 NOV 2014



AERO DESIGN LTD.

9886A MALASPINA ROAD
POWELL RIVER, BC, CANADA, V8A 0G8
TEL: 804.483.8376 www.aerodesign.ca

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2"
X.XX ±0.03
X.X ±0.1

BELL 205, 212, 214, 412 SERIES
EXTERNAL ATTACHMENT PROVISIONS
HIGH MOUNTED INSTALLATION

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.	CHG.
SHEET 2 OF 2	A4	100606	0	PD1

Aircraft Maintenance & Manufacturing
Victoria Transport Canada Centre
103 – 1962 Canso Road
North Saanich, B.C. V8L 5V5

Your file Votre référence

Our file Notre référence

5008-GWWP
RDIMS: 10219971

December 16, 2014

Ascent Helicopters Ltd.
1550 Springhill Road
Parksville, BC
V9P 2T2

Subject: Specific Purpose Flight Permit

Registration: **C-GWWP**
 Manufacturer: **Bell Helicopter Textron**
 Model: **B205A1**
 Serial: **30023**

This letter constitutes a Specific Purpose Flight Permit for the aircraft identified above. This Permit is valid from **December 16, 2014** to **December 30, 2014** and is issued subject to the following conditions:

1. Valid for the purpose of flight testing the Aero Design Ltd. Quick Release Cargo Basket. Test flights shall be conducted in accordance with the Aero Design Flight Test Plan FTP1006.03, Revision 0, dated 10 October 2014, or later accepted revision.
2. Use as a commercial aircraft is prohibited.
3. Crew members only, no passengers except those persons whom the pilot-in-command determines as having a necessary function in the test flight(s) and where that person is essential to the flight. Passenger carrying is prohibited.
4. Maximum permissible take-off weight not to exceed 4762.72 kgs.
5. Flight into known or predicted icing conditions prohibited.
6. All test flights shall be conducted under Day VFR conditions only.
7. Flight over built-up areas prohibited.
8. This Flight Permit shall form part of the permanent aircraft technical record. A copy of this Flight Permit shall be carried on board the aircraft at all times.
9. Flight Manual Supplement FMS751.91 (Rev2), or later accepted revision, shall be carried on board the aircraft at all times.

10. If necessary the Controlling Air Traffic Control unit must be informed of the test program prior to flight.
11. If necessary the permission of the Foreign Aviation Authority is required prior to flight in their airspace.
12. Unless suspended, surrendered or cancelled, this Flight Permit is valid until 23:59hrs on December 30th, 2014.

For the Minister

A handwritten signature in black ink, appearing to read 'Michael Godsell', with a long horizontal stroke extending to the right.

Michael Godsell
Civil Aviation Safety Inspector - Airworthiness
Victoria Transport Canada Centre
Tel: 250 363 6626

Jeff Clarke

From: Brulotte, Michel [michel.brulotte@tc.gc.ca]
Sent: December 11, 2014 11:09 AM
To: 'Jeff Clarke'
Subject: RE: C-14-0978 - Bell 212 Mega Basket

Jeff,

That sounds like a good plan.

Michel

From: Jeff Clarke [mailto:jeff@aerodesign.ca]
Sent: Thursday, December 11, 2014 1:54 PM
To: Brulotte, Michel; Staal, Jack
Subject: RE: C-14-0978 - Bell 212 Mega Basket

Hi Michel,

If we can keep the gross weight below 7500 lbs (Vne = 120 kts up to 7500 lbs) and altitude below 5000 ft (-6 kts @ 5000 ft), the basic 205 Vne limit is the same as the 114 kts established for the basket. I will check with Ascent for where their 205 GW is at.

Jeff

From: Brulotte, Michel [mailto:michel.brulotte@tc.gc.ca]
Sent: December 11, 2014 10:23 AM
To: 'Jeff Clarke'; Staal, Jack
Subject: RE: C-14-0978 - Bell 212 Mega Basket

Jeff,

I don't need control positions since the tests are being done on a different aircraft. We need qualitative assessments that there were adequate control margins and that the vibrations were not objectionable. The problem with a Bell 205 is that the VNE is different than a 212. How are you going to handle that?

Michel

From: Jeff Clarke [mailto:jeff@aerodesign.ca]
Sent: Thursday, December 11, 2014 12:50 PM
To: Staal, Jack; Brulotte, Michel
Subject: C-14-0978 - Bell 212 Mega Basket

Hi Jack, Michel,

Please find attached the completed load test report. If it is acceptable I will arrange for the check flight at 400 lbs cargo per Michel's report.

I am putting together the last of the revised drawings from the old approved configurations and should have them in on Friday or Monday.

Michel – are you looking for control measurements or a qualitative statement for the conditions listed in your report? We will have to fly on a 205 as the 212 is in the field now.

17/12/2014

Thank you,

Jeff Clarke, P.Tech.(Eng.)



Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3

Phone: 604.483.AERO (2376)

Fax: 604.483.2372

TCCA AMF 73-04



17/12/2014

Jeff Clarke

From: Staal, Jack [Jack.Staal@tc.gc.ca]
Sent: December 12, 2014 3:21 PM
To: Johnson, Shawn; 'Jeff Clarke'
Subject: RE: Conformity Inspection, Aero Design Cargo Basket

Hi,

Jeff further to your telephone call regarding conformity.

- 1) For the purpose of conducting the supplemental flight testing, as a minimum an Aero Design company conformity on the B043 form should be completed for the aircraft installation. The basis for this is that TCCA will not be flying this time. Also the open items on the last TCCA conformity attempt were deemed not to affect flight test safety.
- 2) The TCCA conformity should be completed prior to STC issue. The TCCA conformity on a final production item (kit) is acceptable to this office. It need not be installed on a helicopter.

Regards
Jack

17/12/2014

RECOMMENDATIONS

Based on flight test results the Aero Design Basket modification is recommended for approval on B205, and B212 aircraft with the following limitations:

VFR Only

Only one basket be installed on the aircraft, on either the left or right side.

Maximum V_{NE} is 114 KIAS, or basic aircraft V_{NE} , whichever is lowest.

Maximum load in the basket is 267 lbs.

Operating Procedures

The crew should ensure that the load is secured in the basket and that the basket is securely closed prior to flight.

The following performance information must be included in the Flight Manual Supplement:

Cruise performance, and range will be reduced by approximately 10 percent with the Basket installed.

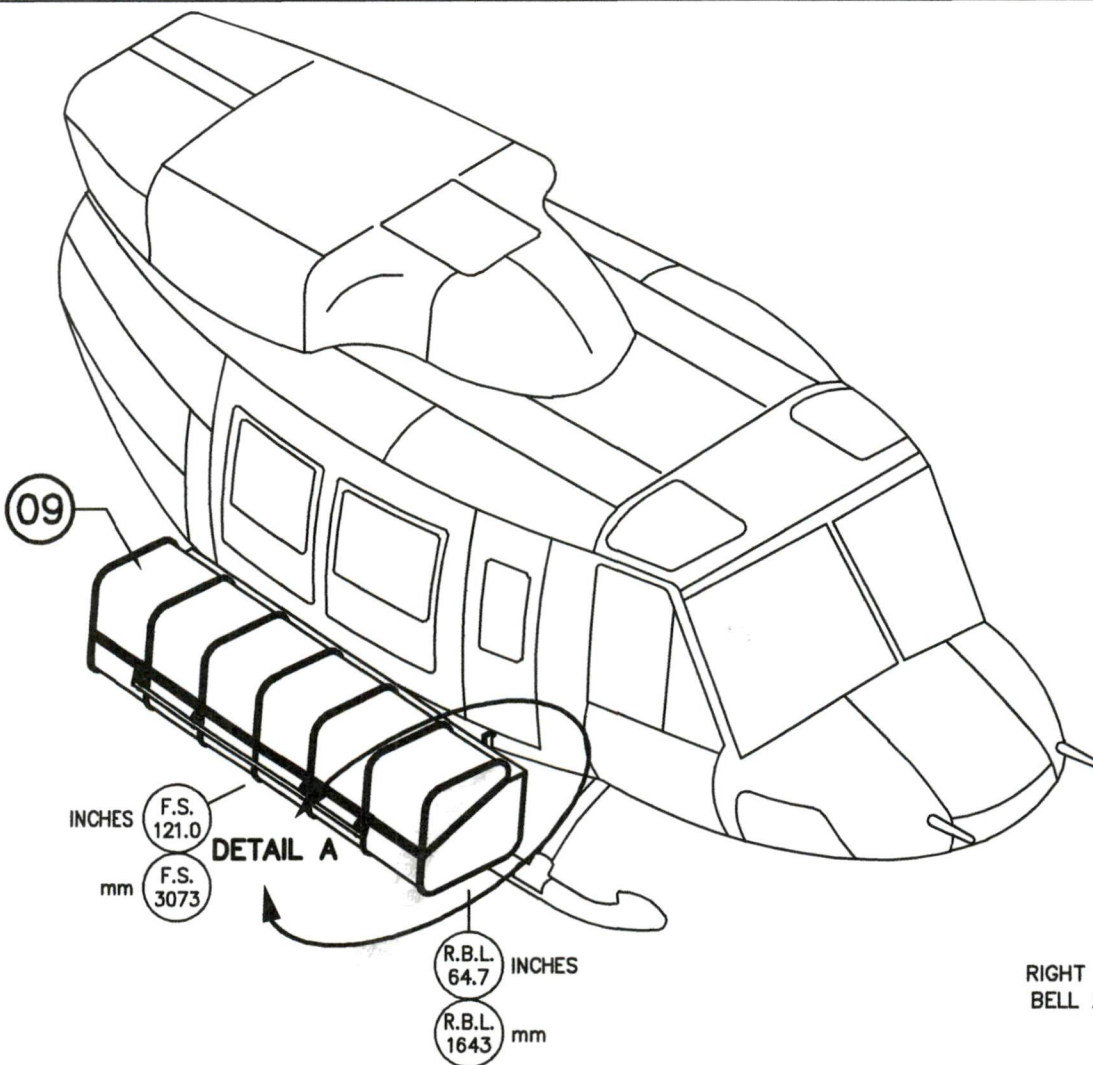
Climb performance will be reduced by 250 fpm.

FURTHER TESTING

If Aerodesign decides to expand the basket cargo weight limit after successful completion of the basket structural tests then the following flight tests must be completed:

<p>LH Ascent to fly. OK OK OK OK See note OK</p>	Hover and Low Speed controllability at speeds up to 20 knots – Ensure adequate control margins.	RH OK
	Controllability in climb at power up to Take-off power – Ensure adequate control margins.	OK
	Controllability at V_{NE} , including turns of up to 30 degrees of bank left and right – Ensure adequate control margins.	OK
	Flight at V_D (127 KIAS) – Ensure no objectionable vibrations.	OK
	Controllability in autorotation, including entry – Ensure adequate control margins.	OK
<p>If Aerodesign decides to expand the V_{NE} envelope beyond 114 KIAS for the basket then it is recommended that a qualified test pilot conduct the tests.</p>		

Note: Left side install - Right cyclic in auto - still within limits
* Bubble left side



- 04 INSTALLATION, HIGH RH
 03 INSTALLATION, HIGH LH
 02 INSTALLATION, LOW RH
 01 INSTALLATION, LOW LH

RIGHT SIDE INSTALLATION SHOWN, LEFT SIDE INSTALLATION OPPOSITE
 BELL 212 SHOWN; BELL 205, 214 AND 412 INSTALLATION IDENTICAL
 NOT TO SCALE

1	1	1	1	100610-02	09	CARGO BASKET ASSEMBLY - EXTENDED LID
1				100606-01-02	08	EXTERNAL ATTACHMENT PROVISIONS, HIGH, RH
	1			100606-01-01	07	EXTERNAL ATTACHMENT PROVISIONS, HIGH, LH
		1		100605-01-02	06	EXTERNAL ATTACHMENT PROVISIONS, LOW, RH
			1	100605-01-01	05	EXTERNAL ATTACHMENT PROVISIONS, LOW, LH
				100602-02-02	04	BASKET INSTALLATION, HIGH, RH
				100602-02-01	03	BASKET INSTALLATION, HIGH, LH
				100602-01-02	02	BASKET INSTALLATION, LOW, RH
				100602-01-01	01	BASKET INSTALLATION, LOW, LH
04	03	02	01	PART NO.	ITEM	DESCRIPTION
QTY	QTY	QTY	QTY	LIST OF MATERIALS		

APPROVALS		DATE
DRAWN:	JEFF CLARKE	24 NOV 2014
CHECKED:	JASON REKVE	27 NOV 2014
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:		
DECIMALS	ANGLES	
X.XXX ±0.010	±1/2°	
X.XX ±0.03		
X.X ±0.1		

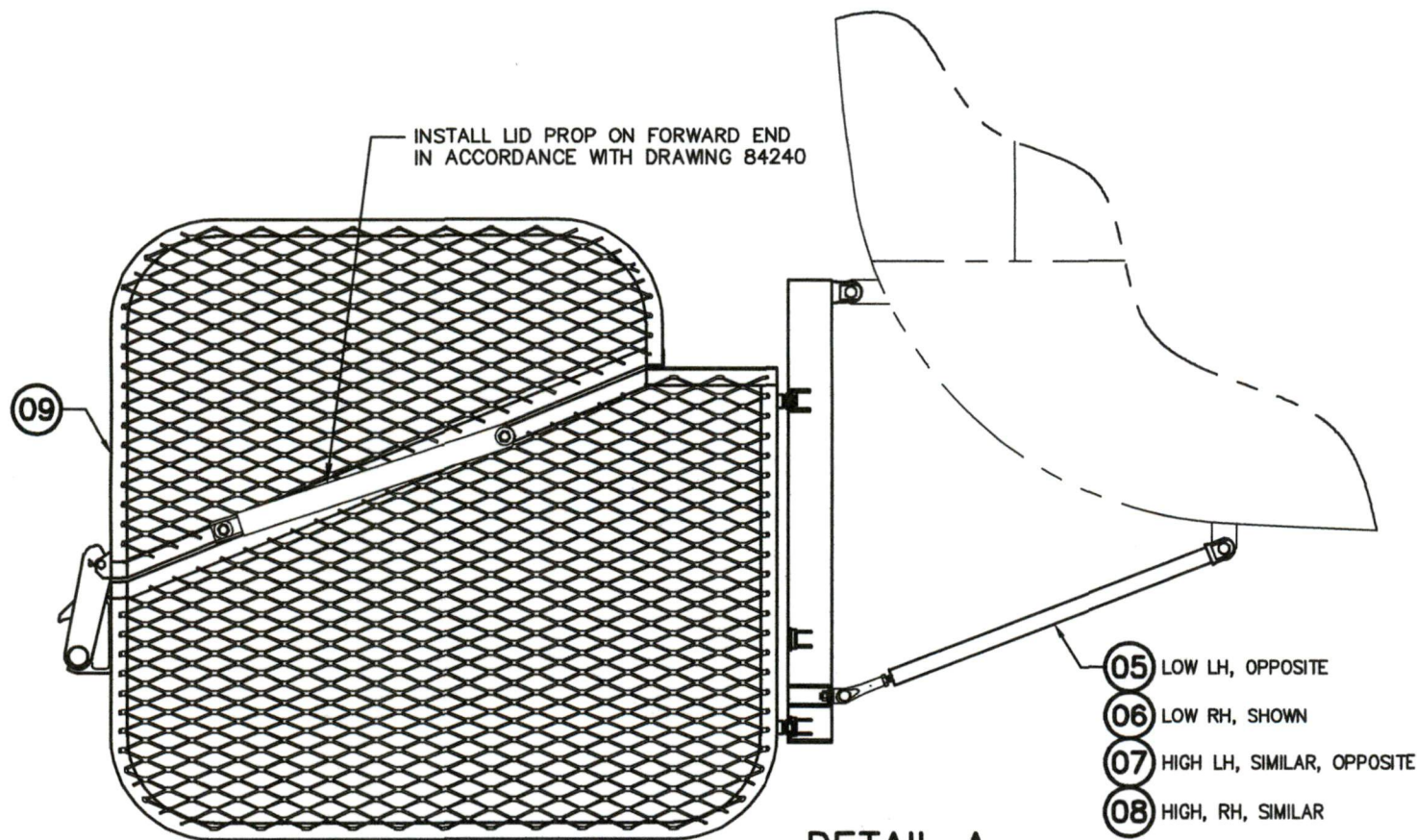


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9888A MALASPINA ROAD
 POWELL RIVER, BC, CANADA, V8A 0G3
 TEL: 604.683.2376 www.aerodesign.ca

BELL 205, 212, 214, 412 SERIES
 QUICK RELEASE MEGA CARGO BASKET
 INSTALLATION - EXTENDED LID


NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.	CHG.
SHEET 1 OF 3	A4	100602	0	A



DETAIL A

NOT TO SCALE
LOOKING AFT AT FORWARD END
RIGHT SIDE SHOWN, LEFT SIDE OPPOSITE

R.B.L.
64.7 INCHES
R.B.L.
1643 mm

APPROVALS		DATE			AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.483.8378 www.aerodesign.ca		
DRAWN: JEFF CLARKE		24 NOV 2014					
CHECKED: JASON REKVE		27 NOV 2014					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:				BELL 205, 212, 214, 412 SERIES QUICK RELEASE MEGA CARGO BASKET INSTALLATION - EXTENDED LID			
DECIMALS		ANGLES					
X.XXX ±0.010		±1/2"					
X.XX ±0.03							
X.X ±0.1							
NOT TO SCALE		DWG. SIZE		DWG. NO.		REV.	CHG.
SHEET 2 OF 3		A4		100602		0	A

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE	*	*

NOTES

1. QUICK RELEASE MOUNTING PROVISIONS INSTALLED IN ACCORDANCE WITH DRAWING 100605 OR 100606 IS A MANDATORY PREREQUISITE FOR THIS INSTALLATION. HIGH SKID LANDING GEAR IS A MANDATORY PREREQUISITE FOR THE LOW BASKET INSTALLATION (ITEM 01 AND 02).
2. REFER TO FLIGHT MANUAL SUPPLEMENT, FMS751.91, FOR LIMITATIONS WITH THE QUICK RELEASE CARGO BASKET INSTALLED.
3. REFER TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS, ICA751.90, FOR MAINTENANCE INFORMATION.
4. LATERAL ARMS IN THE WEIGHT AND BALANCE ARE FOR RIGHT SIDE INSTALLATION. LEFT SIDE INSTALLATION ARMS ARE NEGATIVE.
5. INSTALLATION PROCEDURE:
 - A) LIFT FORWARD END OF BASKET TO HELICOPTER, ENGAGE UPPER FORWARD LUG IN UPPER HOOK IN FORWARD BEAM.
 - B) LIFT AFT END OF BASKET, ENGAGE LOWER FORWARD ATTACHMENT IN LOWER SLOT IN FORWARD BEAM.
 - C) ENGAGE AFT FITTINGS IN KEYWAYS IN AFT BEAM, PUSH BASKET DOWN.
 - D) RETAINING PIN IN LOWER KEYWAY WILL SPRING INTO PLACE WITH A SNAP.

WEIGHT AND BALANCE – METRIC

ITEM	DESCRIPTION	WEIGHT (kg)	LONGITUDINAL		LATERAL	
			ARM (mm)	MOMENT (mm-kg)	ARM (mm)	MOMENT (mm-kg)
05/06	ATTACH PROVISIONS, LOW	5.1	3064	15567	1164	5915
09	BASKET ASSEMBLY (EXT. LID)	48.6	3073	149445	1656	80515
01/02	LOW BASKET INSTALLATION	53.7	3073	165012	1609	86430
07/08	ATTACH PROVISIONS, HIGH	5.3	3150	16575	1165	6131
09	BASKET ASSEMBLY (EXT. LID)	48.6	3081	149827	1656	80515
03/04	HIGH BASKET INSTALLATION	53.9	3088	166402	1608	86646

WEIGHT AND BALANCE – STANDARD

ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL	
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)
05/06	ATTACH PROVISIONS, LOW	11.2	120.64	1351.2	45.84	513.4
09	BASKET ASSEMBLY (EXT. LID)	107.2	121.00	12971.2	65.19	6988.4
01/02	LOW BASKET INSTALLATION	118.4	120.97	14322.4	63.36	7501.8
07/08	ATTACH PROVISIONS, HIGH	11.6	124.02	1438.6	45.88	532.2
09	BASKET ASSEMBLY (EXT. LID)	107.2	121.31	13004.4	65.19	6988.4
03/04	HIGH BASKET INSTALLATION	118.8	121.57	14443.1	63.30	7520.6

APPROVALS	DATE
DRAWN: JEFF CLARKE	24 NOV 2014
CHECKED: JASON REKVE	27 NOV 2014



AERO DESIGN LTD.

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2"
X.XX ±0.03
X.X ±0.1

BELL 205, 212, 214, 412 SERIES
QUICK RELEASE MEGA CARGO BASKET
INSTALLATION – EXTENDED LID

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.	CHG.
SHEET 3 OF 3	A4	100602	0	A

FLIGHT TEST PLAN

FTP1006.03

BELL 205/212/214/412

QUICK RELEASE CARGO BASKET

Prepared by: J. Clarke, P.Tech.(Eng.)

Revision 0, 10 October 2014

Superseded

Aero Design Ltd.



9888A Malaspina Road, Powell River, BC, V8A 0G3

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www.aerodesign.ca

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1.0 INTRODUCTION

The Quick Release Cargo Basket is mounted on the right or left side of the helicopter. The basket is made from steel tubing and expanded steel mesh. It is quickly detachable from the mounting beams that support it.

2.0 REFERENCE TEXT

Aero Design Ltd. Installation Drawings

100602, Revision 0 – Cargo Basket Installation (Extended Lid)

100605, Revision 0 – Quick Release Mounting Provisions Installation (Low Mounted)

100606, Revision 0 – Quick Release Mounting Provisions Installation (High Mounted)

Aero Design Ltd. Flight Manual Supplement FMS751.91, Rev. 2 (draft)

BHT-205A1-FM-1thru -3 – Bell 205A-1 Rotorcraft Flight Manual

BHT-212VFR-FM-1 – Bell 212 Rotorcraft Flight Manual

BHT-214B-FM-1 – Bell 214B Rotorcraft Flight Manual

BHT-214B1-FM-1 – Bell 214B-1 Rotorcraft Flight Manual

BHT-412-FM-1 thru -4 – Bell 412 Rotorcraft Flight Manual

3.0 FLIGHT TEST OBJECTIVE

Flight testing of the Quick Release Cargo Basket is meant to demonstrate that the installation is free of excessive vibration at speeds from hover thru to V_d , and does not produce undesirable effects to the handling and performance qualities of the helicopter.

This flight testing is in advance of flight testing by Transport Canada Flight Test Division in support of obtaining a Supplemental Type Certificate.

4.0 TEST PREPARATION

4.1 Instrument Calibration

The maintenance records of the test helicopter will be checked to ensure the airspeed indicator has been calibrated within the specified time period.

4.2 Equipment

The helicopter will be fitted with the Low Quick Release Mounting Provisions on the left hand side in accordance with drawing 100605.

The helicopter will be fitted with the High Quick Release Mounting Provisions on the right hand side in accordance with drawing 100606.

The helicopter will be fitted with the Quick Release Cargo Basket with Extended Lid Installation in accordance with drawing 100602.

4.3 Flight Test Crew

Two crew members will be required for the test:

- 1) Pilot with training and experience appropriate to the task of testing this equipment.
- 2) Test observer, either a DAR or a qualified alternate appointed by him, beside the pilot.

All members of the crew will be equipped to communicate via intercom.

Seating arrangement of the observer(s) may be limited by loading requirements.

4.4 Documents

These test flights require a FLIGHT PERMIT issued by Transport Canada. Flight permit must allow flight to 1.11 Vne.

The draft Flight Manual Supplement, FMS751.91 Revision 2, shall be on board the aircraft.

The Pilot will familiarize himself with the contents of this Test Plan and the Flight Manual Supplement prior to flight.

4.5 Weight and Balance

The helicopter will be loaded with sufficient fuel and ballast to produce the following conditions for flight:

- A) Helicopter un-modified*, with weight and balance within limits specified in the flight manual
- B) Cargo Basket configuration 100602-02-02 (high mounted with extended lid) installed on the right hand side, basket loaded with 400 lbs.
- C) Cargo Basket configuration 100602-01-01 (low mounted with extended lid) installed on the left hand side, basket loaded with 400 lbs.

*Note: Quick Release Mounting Provisions may be installed.

C of G must remain within the limits specified in the Flight Manual.

Loading information specific to the Quick Release Cargo Basket is contained in the Flight Manual Supplement, FMS751.91. The basket will be loaded to 400 lbs, secured to prevent shifting in flight.

5.0 FLIGHT TESTS

One flight is required for each of the conditions listed in 4.5 above.

The flights are to be conducted as follows:

Take off and establish cruise at 50 kts. Increase speed in 10 kt increments up to Vne. Recover from Vne, then accelerate to Vd ($1.1 \times Vne$).

Vne as follows, refer to Flight Manual:

Bell 205A-1

GW	Up to 7500 lbs	7500 to 8500 lbs	over 8500 lbs
Vne =	120 KCAS	115 KCAS	110 KCAS

Vne at sea level to 3000 ft, reduce by 3 knots per 1000 feet.

Bell 212

GW	Up to 7500 lbs	11200 lbs
Vne =	130 KIAS	100 KIAS (decrease linearly from 7500 lbs to 11200 lbs)

Vne at sea level to 3000 ft, reduce by 3 knots per 1000 feet.

Bell 214B / B-1

Vne = 140 KIAS refer to placard for reductions with altitude and temperature

Bell 412

Vne = 140 KIAS refer to placard for reductions with altitude and temperature

Flight testing performed by a Transport Canada Flight Test Division Pilot may deviate from this test plan at the discretion of the test pilot in order to complete a Transport Canada prepared flight test report.

6.0 RECORDING OF RESULTS – BELL 205/212Model: Bell 212

Serial Number: _____

Registration: _____

Gross Weight: _____

Check (✓) if acceptable. Record Vne/Vd achieved.

Bell 212	Airspeed (KIAS)											Vne (130)	Vd (144)
Configuration	50	60	70	80	90	100	110	120					
Un-modified													
100601-01-01 or 100601-02-01 Basket (RH)													
100601-01-02 or 100601-02-01 Basket (LH)													

Observations:

7.0 RECORDING OF RESULTS – BELL 214B / B-1Model: Bell 214B

Serial Number: _____

Registration: _____

Gross Weight: _____

Check (✓) if acceptable. Record Vne/Vd achieved.

Bell 412	Airspeed (KIAS)										
Configuration	50	60	70	80	90	100	110	120	130	Vne (140)	Vd (156)
Un-modified											
100601-01-01 or 100601-02-01 Basket (RH)											
100601-01-02 or 100601-02-01 Basket (LH)											

Observations:

8.0 RECORDING OF RESULTS – BELL 412Model: Bell 412

Serial Number: _____

Registration: _____

Gross Weight: _____

Check (✓) if acceptable. Record Vne/Vd achieved.

Bell 214B	Airspeed (KIAS)										
Configuration	50	60	70	80	90	100	110	120	130	Vne (140)	Vd (156)
Un-modified											
100601-01-01 or 100601-02-01 Basket (RH)											
100601-01-02 or 100601-02-01 Basket (LH)											

Observations:

Jeff Clarke

From: Jim Tinson, Wings Engineering Ltd. [jim@wingsengineering.ca]
Sent: December 18, 2014 8:48 AM
To: 'Jeff Clarke'
Subject: RE: WPN1412: New project No. 1006 - Bell Medium Mega Basket

Hi Jeff,

Minor fix-ups for pages 13 and 14. ✓

FBDs should be easier for us.

For more complex analysis I have used SWX Simulation FEA but Motion might be the better modeller for quickly finding reactions.

My old GeoStar FEA was very good and simple for this type of self-check. i.e.; simple 3D beam members with 6 DoFs at each connection.

I like the BIG FONT wrt the skid gear requirements. ✓

What are you doing to resolve the Change control?

i.e.; is it a quick reference that will be deleted at the official release of Rev 0 where you will note Rev 0 and the Rev Date on all documents? ✓

Good luck with your test flight.

Cheers,

Jim Tinson FEC, PEng, DAR
T/F: 604.274.5647, C: 604.418.8955
WINGSENGINEERING.CA

18/12/2014

Aft beam is critical due to higher combined maneuvering loads, and has a drag link to support the fore/aft load. Drag is applied equally to upper and lower attachments. The drag link supports the longitudinal load at the bottom. Reaction on fuselage attachments:

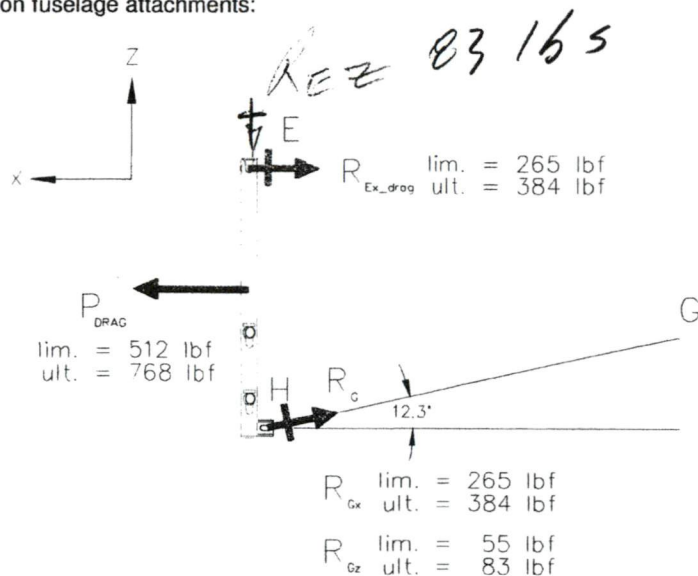


Figure 6.2.3 – Drag Reactions (looking inboard)

$$R_{Ex_drag} := \frac{P_{drag_ult}}{2}$$

$$R_{Ex_drag} = 384 \cdot \text{lbf}$$

Ultimate Longitudinal reaction at E

$$R_{Gx} := \frac{P_{drag_ult}}{2}$$

$$R_{Gx} = 384 \cdot \text{lbf}$$

Ultimate Longitudinal reaction at H/G (through drag link)

$$R_{Gy} := R_{Gx} \cdot \tan(20.1\text{-deg})$$

$$R_{Gy} = 140 \cdot \text{lbf}$$

Ultimate Lateral reaction at H/G (through drag link)

$$R_{Gz} := R_{Gx} \cdot \tan(12.3\text{deg})$$

$$R_{Gz} = 84 \cdot \text{lbf}$$

Ultimate Vertical reaction at H/G (through drag link)

@ RH
(note to self only)

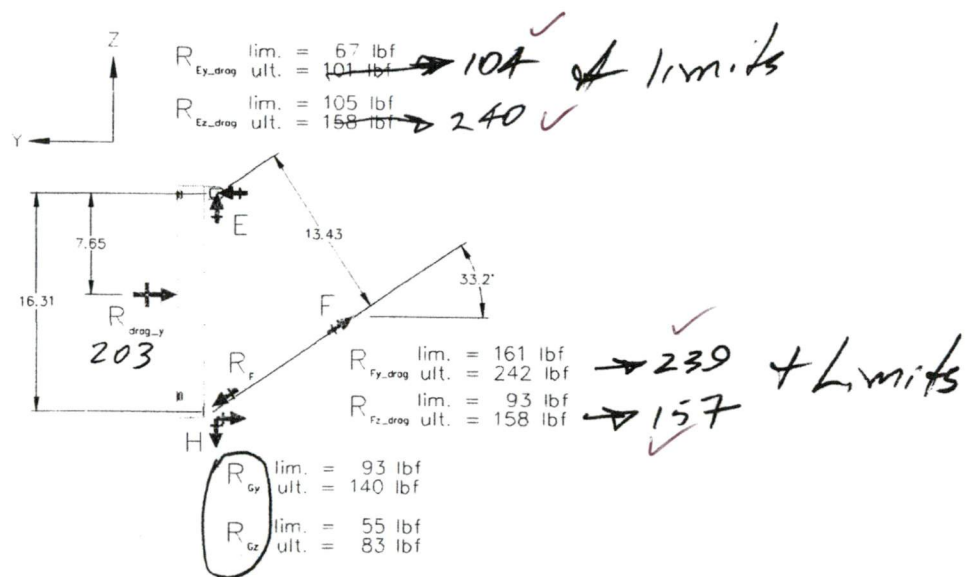


Figure 6.2.4 – Drag reactions (looking aft)

Sum moments about E = 0:

$$R_{F_drag} := \frac{(R_{drag_y} \cdot 7.65 \text{ in} + R_{Gy} \cdot 16.31 \text{ in})}{13.43 \text{ in}}$$

$$R_{F_drag} = 286 \cdot \text{lbf}$$

Ultimate Reaction in strut at H/F

$$R_{Fy_drag} := R_{F_drag} \cdot \cos(33.2 \text{ deg})$$

$$R_{Fy_drag} = 239 \cdot \text{lbf}$$

Ultimate Lateral reaction at H/F

$$R_{Fz_drag} := R_{F_drag} \cdot \sin(33.2 \text{ deg})$$

$$R_{Fz_drag} = 157 \cdot \text{lbf}$$

Ultimate Vertical reaction at H/F

Sum forces horizontally = 0:

$$R_{Ey_drag} := R_{drag_y} + R_{Gy} - R_{Fy_drag}$$

$$R_{Ey_drag} = 104 \cdot \text{lbf}$$

Ultimate Lateral reaction at E

Sum forces vertically = 0:

$$R_{Ez_drag} := R_{Fz_drag} + R_{Gz}$$

$$R_{Ez_drag} = 240 \cdot \text{lbf}$$

Ultimate Vertical reaction at E

Jeff Clarke

From: Jim Tinson, Wings Engineering Ltd. [jim@wingsengineering.ca]
Sent: December 12, 2014 11:44 AM
To: 'Jeff Clarke'
Subject: RE: WPN1412: New project No. 1006 - Bell Medium Mega Basket

Hi Jeff,

Thanks for ER1006 01_Odraft2.pdf.

Did we do the draft1 review over the phone?

Today's review notes wrt draft2:

Pg. 2 6.0 FAR 29.727 is not in the Cert Plan. You have advised that the CP is in revision and that this detail will be included in the CP and in the Compliance Checklist. ✓

Pg. 6 Figure 4.2.1 Contains two vertical load arrows; one double ended and one single. Why? Remove one? ✓

Pgs 7/8 4.4 Drag Loads. Please note as TC accepted. Where is TC's acceptance? CP???
Noted in CP ✓

Pg. 11 See attached redlined copy. You made the part of the change from the last review but you seemed to have missed the update to 2431 lbf on Figure 5.6.1. ✓

Pg. 12 See attached redlined copy. We discussed the additional lateral loads induced by the Drag Link but they still don't seem right to me.

Pg. 13 See attached redlined copy. The compound angled Drag Link is just a little more complicated than we last discussed.

Please add a point H (?) for the lower attachment point on the aft vertical beam. ✓

Please see attached 3D sketch for the Drag Link Reactions and confirm/amend and redraw for inclusion in this report. ✓

and amend the balance of the calculations as required. ✓

Pg. 17 Drawings 100601 & 100602 notes below Figure 6.0.1. Very important info and it should be more visible on your drawings. ✓

Please make sure that this info is stand-alone first note followed by a second note wrt Q/R installation. ✓

This restriction/requirement should also be noted in the ICA. ✓ → *Compatibility Section*
 For one some of my survey pods this type of high gear requirement is noted on the STC.

Cheers,

Jim Tinson FEC, PEng, DAR
 T/F: 604.274.5647, C: 604.418.8955
 WINGSENGINEERING.CA

From: Jeff Clarke [mailto:jeff@aerodesign.ca]
Sent: December-11-14 9:02 AM
To: 'Jim Tinson, Wings Engineering Ltd.'

17/12/2014

Aft beam is critical due to higher combined maneuvering loads, and has a drag link to support the fore/aft load. Drag is applied equally to upper and lower attachments. The drag link supports the longitudinal load at the bottom. Reaction on fuselage attachments:

$$R_{Ex_drag} := \frac{P_{drag_ult}}{2}$$

$$R_{Ex_drag} = 384 \cdot \text{lbf}$$

Ultimate Longitudinal reaction at E

$$\Sigma M_E = 0$$

$$R_{Ey_drag} := \frac{R_{drag_y}}{2}$$

$$R_{Ey_drag} = 101 \cdot \text{lbf}$$

Ultimate Lateral reaction at E

$$13.43 \times R_F = 203 \times 7.56 + 140 \times 1.6$$

$$R_F = \sim 281 \text{ lb.}$$

$$R_{Fy} = 235 \text{ lb.}$$

$$H \quad R_{Gx} := \frac{P_{drag_ult}}{2}$$

$$H \quad R_{Gx} = 384 \cdot \text{lbf}$$

Ultimate Longitudinal reaction at G (through drag link)

$$H \quad R_{Gy} := R_{Gx} \cdot \tan(20.1 \text{ deg})$$

$$H \quad R_{Gy} = 140 \cdot \text{lbf}$$

Ultimate Lateral reaction at G (through drag link)

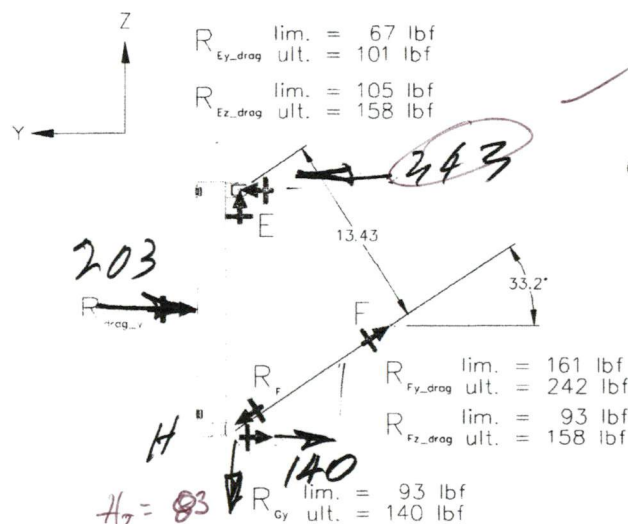


Figure 6.2.3 – Drag reactions (looking aft)

Sum forces horizontally = 0:

$$R_{Fy_drag} := R_{drag_y} + R_{Gy} - R_{Ey_drag}$$

$$R_{Fy_drag} = 242 \cdot \text{lbf}$$

Ultimate Lateral reaction at F

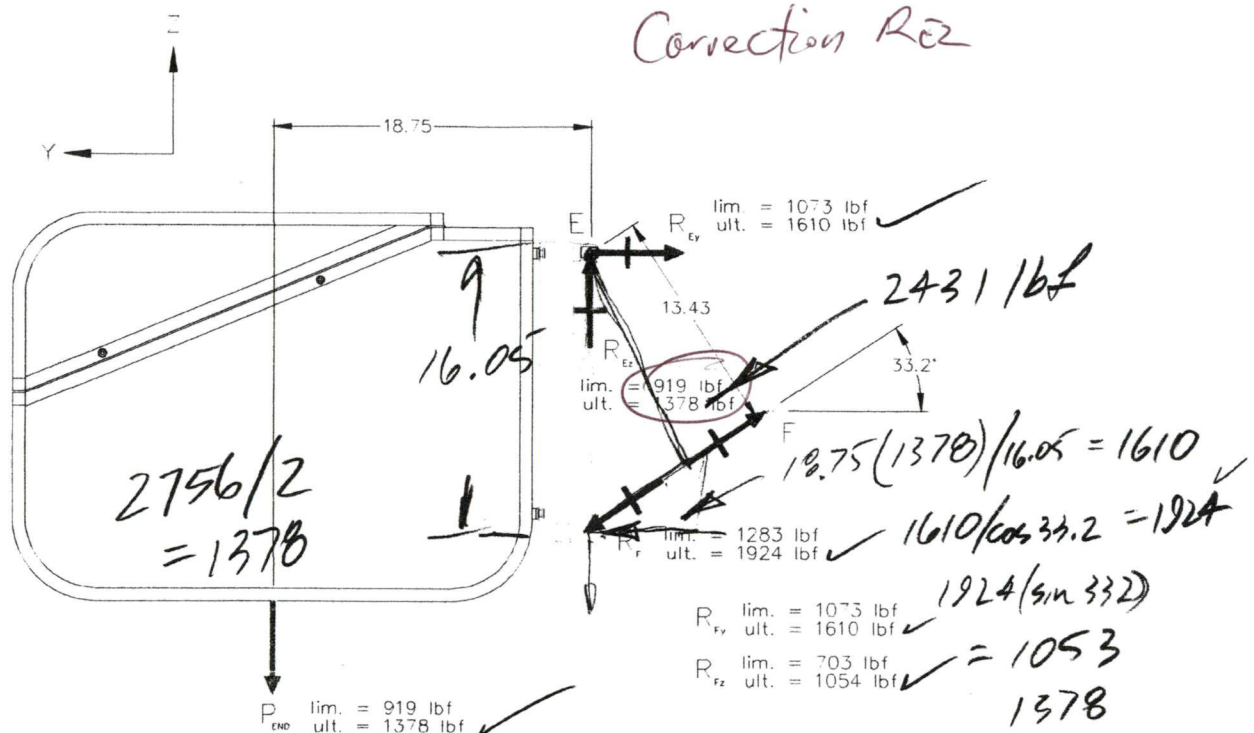
$$\Sigma F_y = 0$$

$$R_{Fz_drag} := R_{Fy_drag} \cdot \tan(33.2 \text{ deg})$$

$$R_{Fz_drag} = 158 \cdot \text{lbf}$$

Ultimate Vertical reaction at F

$$R_{Ey} = 203 + 140 - 235 = 108 \text{ lb.}$$



Reaction from basket on helicopter attachments:

Sum moments about E = 0:

$$R_F := \frac{P_{ult_end} \cdot 18.75 \text{ in}}{13.43 \text{ in}}$$

$$R_F = 1924 \cdot \text{lbf}$$

Ultimate Compression in Strut at F

$$R_{Fy} := R_F \cdot \cos(33.2 \text{ deg})$$

$$R_{Fy} = 1610 \cdot \text{lbf}$$

Ultimate Lateral reaction at F

$$R_{Fz} := R_F \cdot \sin(33.2 \text{ deg})$$

$$R_{Fz} = 1054 \cdot \text{lbf}$$

Ultimate Vertical reaction at F

Sum forces horizontally = 0:

$$R_{Ey} := R_{Fy}$$

$$R_{Ey} = 1610 \cdot \text{lbf}$$

Ultimate Lateral reaction at E

Sum forces vertically = 0:

$$R_{Ez} := P_{ult_end} + R_{Fz}$$

$$R_{Ez} = 2432 \cdot \text{lbf}$$

Ultimate Vertical reaction at A/E

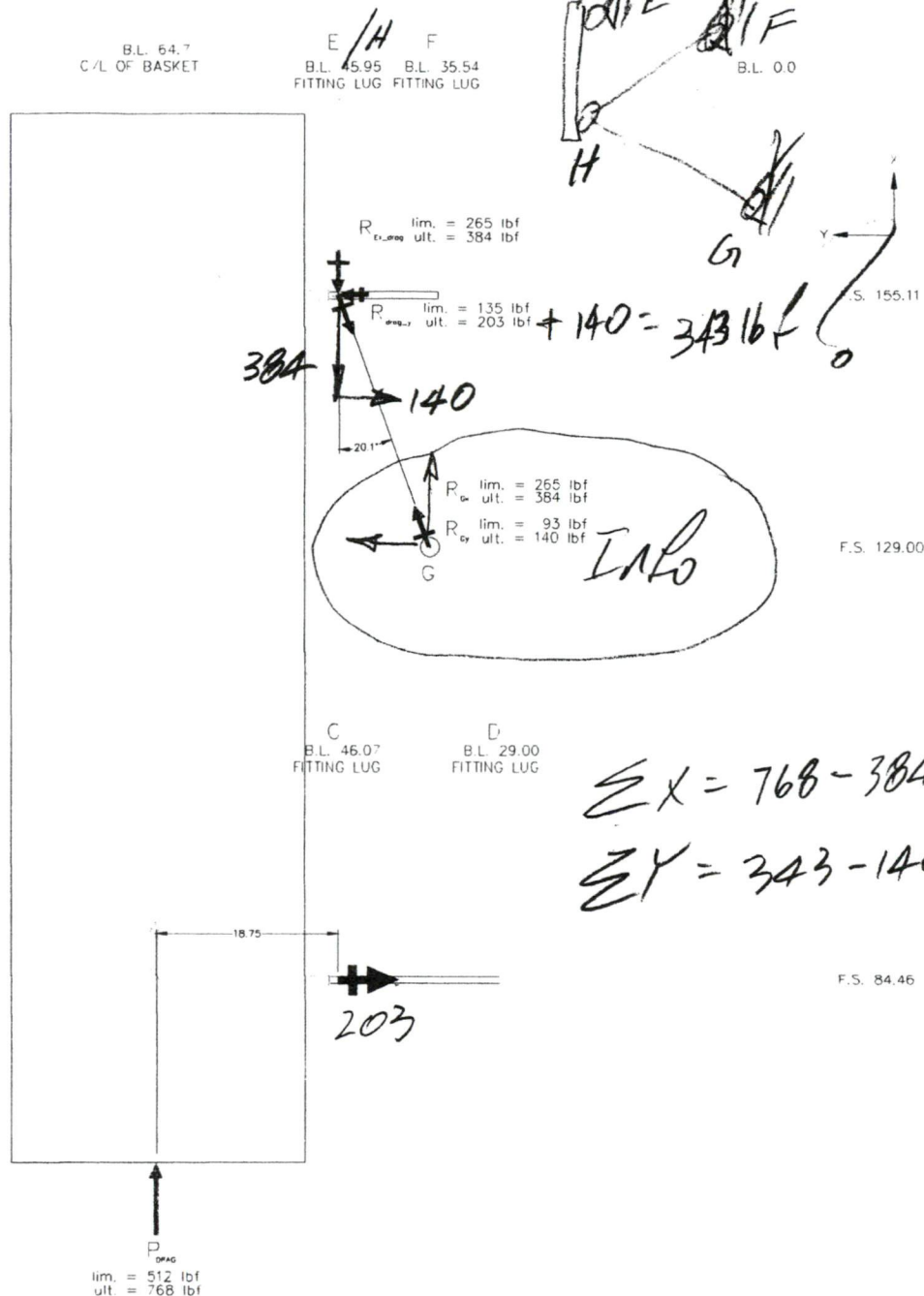


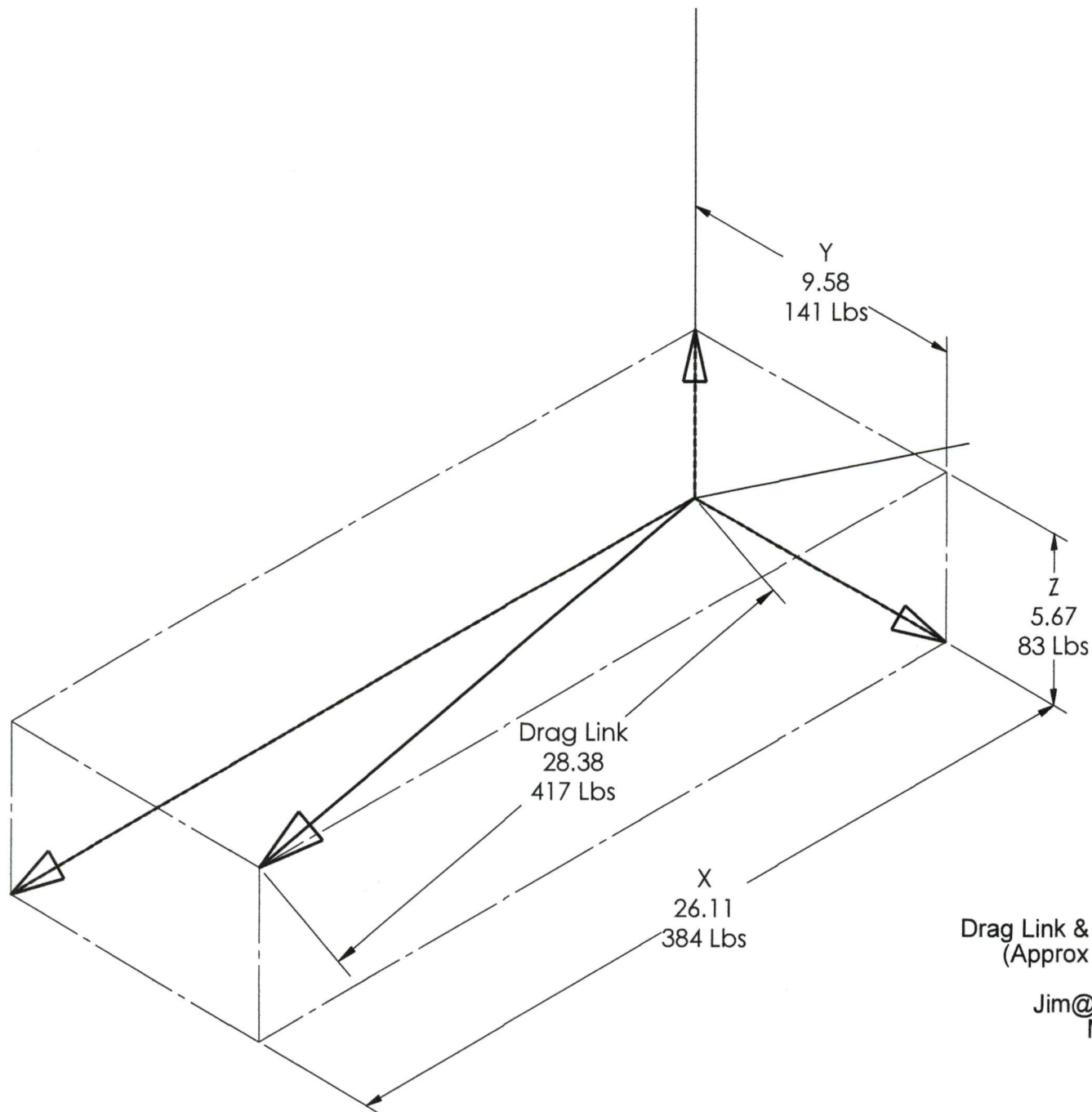
Figure 5.6.2 – Drag reactions (looking down)

Sum moments about C (looking down):

$$R_{\text{drag}_y} := \frac{P_{\text{drag_ult}} \cdot 18.75 \text{ in}}{71.0 \text{ in}}$$

$$R_{\text{drag}_y} = 203 \cdot \text{lbf} \quad \checkmark$$

Ultimate lateral reaction (Y direction) due to drag at aft attachment E



WPN1412
Drag Link & X Y Z Values - 2nd 3D View
(Approx Location wrt Vert Beam)
wrt 384 lbs Aft
Jim@WingsEngineering.ca
M: 606-418-8955
13 Dec 2014

Aero Design Ltd.



9888A Malaspina Road
Powell River, BC, V8A 0G3
Phone: 604-483-2376
Fax: 604-483-2372
www.aerodesign.ca

FMS751.91

BELL 205A-1 / 212 / 412

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT
for the
INSTALLATION of the AERO DESIGN
QUICK RELEASE CARGO BASKET
AND/OR QUICK RELEASE STEP

CARGO BASKET MODELS:
75101, 95501, 100601, 100602

TCCA Supplemental Type Certificate No. SH07-56
FAA Supplemental Type Certificate No. SR02730NY
EASA Supplemental Type Certificate No. _____

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory. Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 205A-1 / 212 / 412 when fitted with the Quick Release Cargo Basket or Step Installation. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.

DRAFT

Table of Contents

I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	4
V	Weight and Balance	5
VI	Installation / removal instructions	11

Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	07 Sept, 2007	None	N/A	N/A
1	16 July, 2008	All	N/A	N/A
2	05 Nov 2014	All		

I LIMITATIONS

1. The maximum load in the Aero Design Ltd. Quick Release Cargo Basket models 751 and 955 is 300 lb. (135.7 kg).

The maximum load in the Aero Design Ltd. Quick Release Cargo Basket model 1006 is 400 lb. (180 kg).

2. Only one basket may be installed on the helicopter, on the right or left side.
3. Flight operations limited to VFR conditions with AERO Design Ltd. Quick Release Cargo Basket installed.
4. V_{NE} is unchanged from the basic rotorcraft.
5. Quick Release Step may be installed on the right and/or left side when the basket is removed. Installation on both sides is approved.

II NORMAL PROCEDURES

1. Pre-flight inspections:
 - a) Ensure that all cargo stored in the cargo basket is properly tied down and secured for flight.
 - b) Ensure that the lid of cargo basket is closed and secured.
 - c) Ensure the basket is locked in position on the beams. Pull up on the forward and aft end of the basket to check.
 - d) Ensure the step is locked in position on the beams. Pull up on the forward and aft end of the step to check.

CAUTION

It is possible to exceed the lateral centre of gravity limits of the rotorcraft under some loading conditions. Pilots must ensure that lateral C of G is within limits when loading the basket.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

Cargo Basket Model 751:

1. Cruise performance and range will be reduced by approximately 10 percent with the Cargo Basket installed.
2. Climb performance will be reduced by up to 150 fpm with the Cargo Basket installed.

Cargo Basket Model 955:

1. Cruise performance and range will be reduced by approximately 15 percent with the Cargo Basket installed.
2. Climb performance will be reduced by up to 250 fpm with the Cargo Basket installed.

Cargo Basket Model 1006:

1. Cruise performance and range will be reduced by approximately ?? percent with the Cargo Basket installed.
2. Climb performance will be reduced by up to ??? fpm with the Cargo Basket installed.

V WEIGHT AND BALANCE

1. The following weight and balance is for the low mounted quick release cargo basket configuration, installed in accordance with drawing 75101.

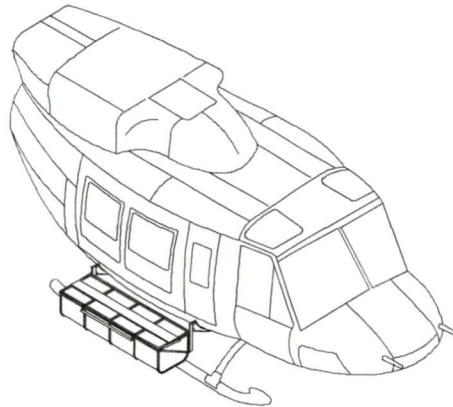


Figure 1 – Quick Release Cargo Basket Configuration (Model 751)

Quick Release Cargo Basket Configuration

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Basket Only ¹	49.5 lb	119.5 in	5 915 in*lb	+/- 62.2 in	+/- 3 079 in*lb
	22.4 kg	3035 mm	67 979 mm*kg	+/- 1580 mm	+/- 35 389 mm*kg
Cargo ² (MAX)	300 lb	119.5 in	35 850 in*lb	+/- 62.2 in	+/- 18 660 in*lb
	135.7 kg	3035 mm	411 991 mm*kg	+/- 1580 mm	+/- 214 480 mm*kg

2. The following weight and balance is for the low mounted quick release cargo basket configuration, installed in accordance with drawing 95501.

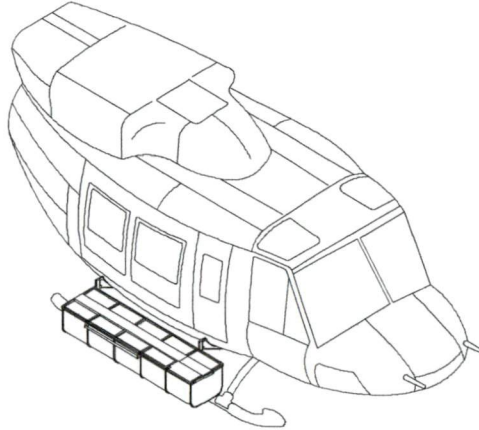


Figure 2 – Quick Release Cargo Basket Configuration (Model 955)

Quick Release Cargo Basket Configuration

Item	Weight	Longitudinal		Lateral (+ right)	
		Arm	Moment	Arm	Moment
Basket Only ¹	66.8 lb	111.1 in	7 421.5 in*lb	+ 63.9 in	+ 4 268.5 in*lb
	30.8 kg	2822 mm	86 918 mm*kg	+ 1623 mm	+ 49 988 mm*kg
Cargo ² (MAX)	300 lb	111.1 in	33 330 in*lb	+ 63.9 in	+ 19 170 in*lb
	135.7 kg	2822 mm	382 945 mm*kg	+ 1623 mm	+ 220 241 mm*kg

3. The following weight and balance is for the quick release cargo basket with standard lid configuration, installed in accordance with drawing 100601.

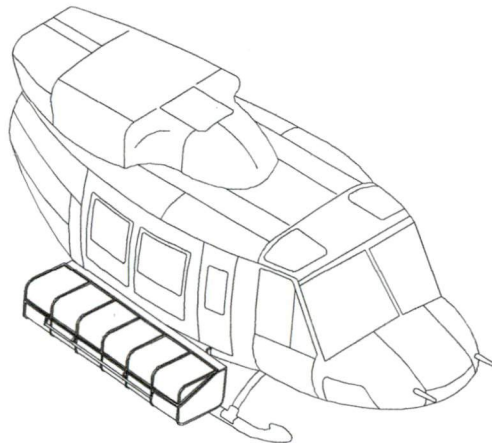


Figure 3 – Quick Release Cargo Basket Configuration (Model 100601)

Quick Release Cargo Basket Configuration – Low Mount

Item	Weight	Longitudinal		Lateral (+ right)	
		Arm	Moment	Arm	Moment
Basket Only ¹	100.0 lb	121.0 in	12 100 in*lb	+ 64.7 in	+ 6 469 in*lb
	45.4 kg	3073 mm	139 407 mm*kg	+ 1643 mm	+ 74 531 mm*kg
Cargo ² (MAX)	400 lb	121.0 in	48 400 in*lb	+ 64.7 in	+ 25 876 in*lb
	180 kg	3073 mm	557 629 mm*kg	+ 1643 mm	+ 298 124 mm*kg

Quick Release Cargo Basket Configuration – High Mount

Item	Weight	Longitudinal		Lateral (+ right)	
		Arm	Moment	Arm	Moment
Basket Only ¹	100.0 lb	121.3 in	12 131 in*lb	+ 64.7 in	+ 6 469 in*lb
	45.4 kg	3 081 mm	139 764 mm*kg	+ 1643 mm	+ 74 531 mm*kg
Cargo ² (MAX)	400 lb	121.3 in	48 524 in*lb	+ 64.7 in	+ 25 876 in*lb
	180 kg	3 081 mm	559 058 mm*kg	+ 1643 mm	+ 298 124 mm*kg

4. The following weight and balance is for the quick release cargo basket with extended lid configuration, installed in accordance with drawing 100602.

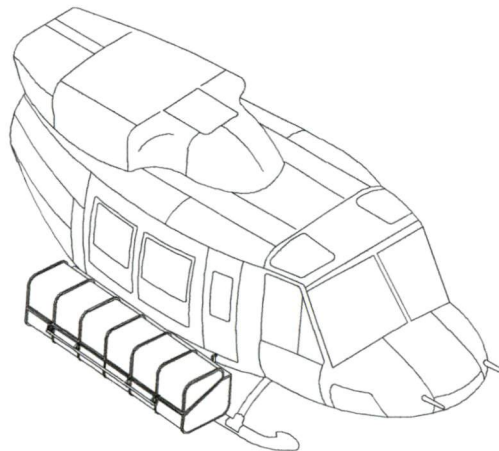


Figure 4 – Quick Release Cargo Basket Configuration (Model 100602)

Quick Release Cargo Basket Configuration – Low Mount

Item	Weight	Longitudinal		Lateral (+ right)	
		Arm	Moment	Arm	Moment
Basket Only ¹	109.0 lb	121.0 in	13 189 in*lb	+ 64.5 in	+ 7 025 in*lb
	49.4 kg	3073 mm	151 954 mm*kg	+ 1637 mm	+ 80 932 mm*kg
Cargo ² (MAX)	400 lb	121.0 in	48 400 in*lb	+ 64.7 in	+ 25 876 in*lb
	180 kg	3073 mm	557 629 mm*kg	+ 1643 mm	+ 298 124 mm*kg

Quick Release Cargo Basket Configuration – High Mount

Item	Weight	Longitudinal		Lateral (+ right)	
		Arm	Moment	Arm	Moment
Basket Only ¹	109.0 lb	121.3 in	13 223 in*lb	+ 64.5 in	+ 7 025 in*lb
	49.4 kg	3 081 mm	152 343 mm*kg	+ 1637 mm	+ 80 932 mm*kg
Cargo ² (MAX)	400 lb	121.3 in	48 524 in*lb	+ 64.7 in	+ 25 876 in*lb
	180 kg	3 081 mm	559 058 mm*kg	+ 1643 mm	+ 298 124 mm*kg

Aero Design Ltd.

FMS751.91

¹ Weight and balance is for Cargo Basket only. It is expected the mounting provisions have been included in the basic rotorcraft weight and balance at time of initial installation.

² Longitudinal and Lateral moment arms are given only for the center of the Cargo Basket. Due to the length of the basket, some loading arrangements may require that actual moment arms be measured, to determine the correct moments about the center of gravity.

CAUTION:

It is possible to exceed lateral CG limits in some configurations.

5. The following weight and balance is for the quick release step configuration, installed in accordance with drawing 80001.

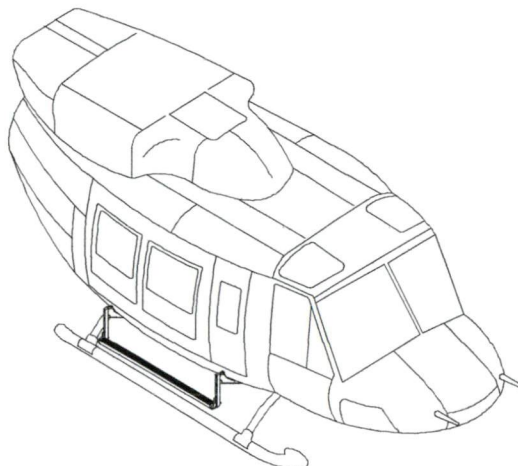


Figure 5 – Quick Release Step Configuration

Quick Release Step Configuration

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Step Only ¹	7.8 lb	119.8 in	934 in*lb	+/- 52.2 in	+/- 407 in*lb
	3.5 kg	3043 mm	10 650 mm*kg	+/- 1326 mm	+/- 4 641 mm*kg

¹ Weight and balance is for Step only. It is expected the mounting provisions have been included in the basic rotorcraft weight and balance at time of initial installation.

VI INSTALLATION / REMOVAL INSTRUCTIONS

The Quick Release Mounting Beams are installed in accordance with drawing 75102, 100605 or 100606. The Quick Release Basket is installed in accordance with drawing 75101, 95501, 100601 or 100602. The Quick Release Step is installed in accordance with drawing 80001. Removal of the basket or step leaving the beams in place is an approved configuration for flight. Logbook entry indicating installation or removal of basket or step and which weight and balance amendment is in effect is required.

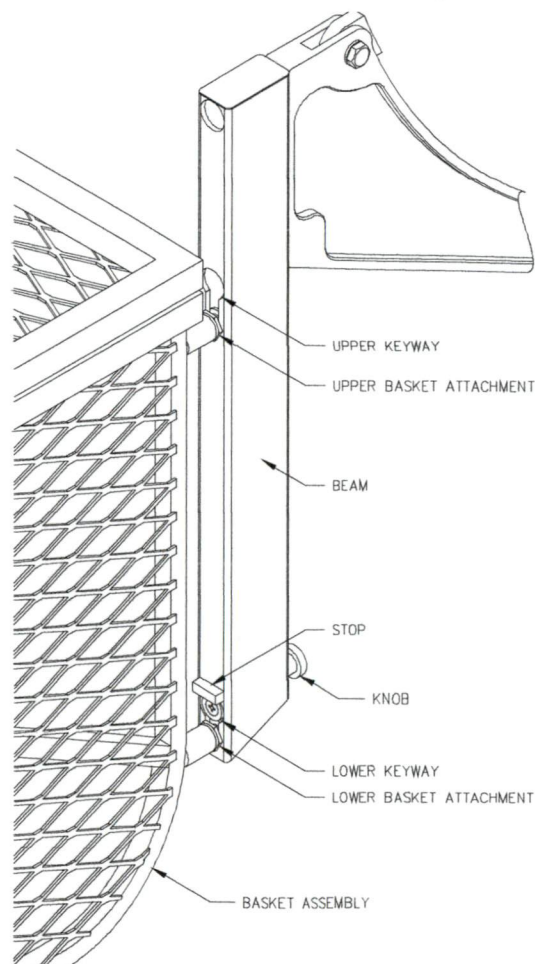


Figure 6 – Basket Attachment (751 configuration shown)

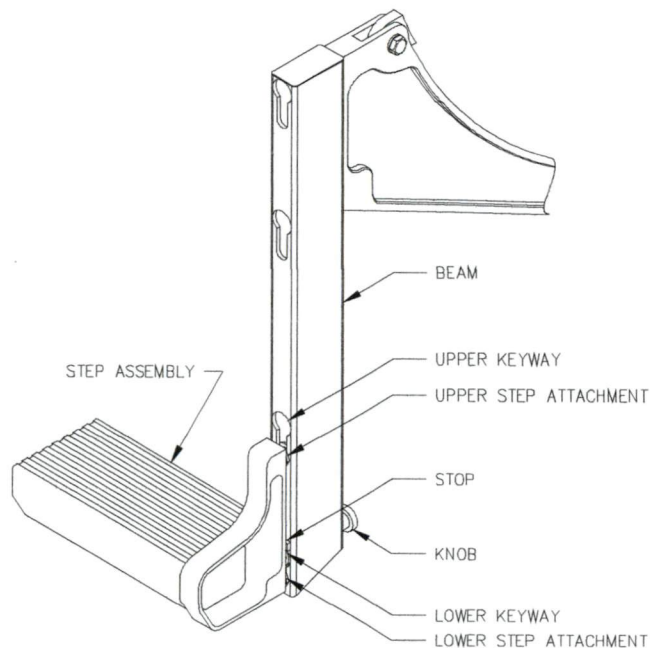


Figure 7 – Step Attachment

Installation and removal instructions are the same for the Quick Release Basket and Quick Release Step Assembly.

751 Mounting Provisions Configuration

1. Installation - Refer to Figure 6/7.
 1. Set upper attachment into upper keyway on forward and aft beams.
 2. At forward end, lift basket or step until lower attachment fitting hits stop over keyway. Push fitting into keyway and slide down until locked. Repeat for aft end.
2. Removal - Refer to Figure 6/7.
 1. Pull knob at bottom end of forward beam and lift basket or step until lower attachment fitting is free of keyway. Keep upper attachment in keyway in beam. Repeat for aft end.
 2. Lift basket or step until upper attachments are out of keyways in beams and remove from helicopter.

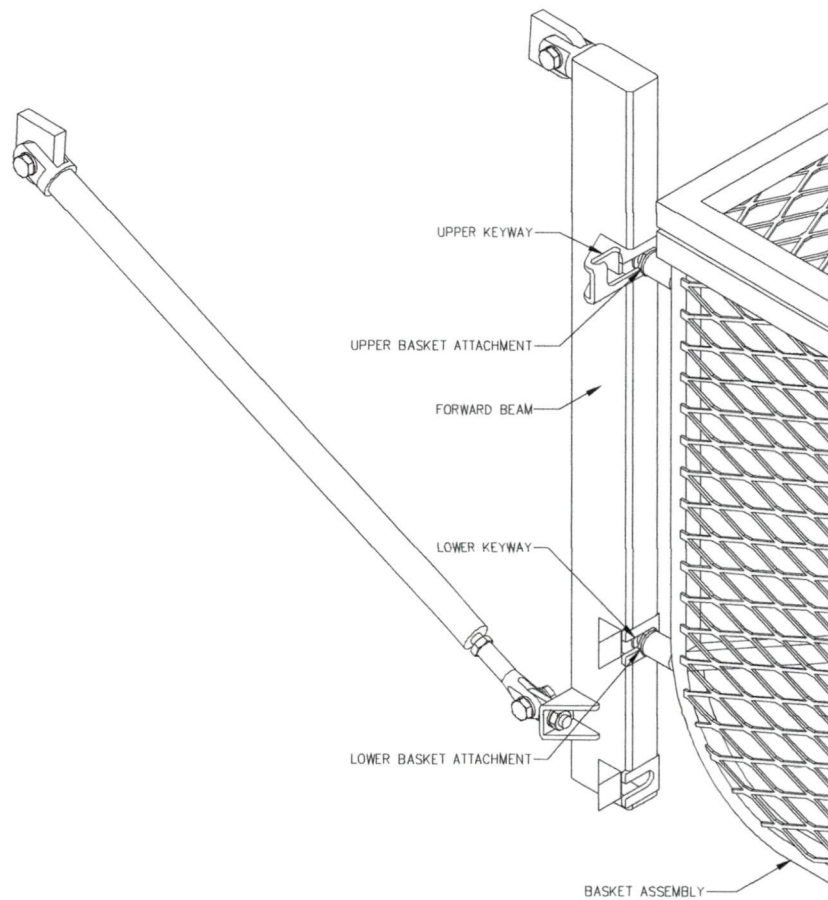


Figure 8 – Forward Basket Attachment (1006 Configuration)

1006 Mounting Provisions Configuration

1. Installation - Refer to Figure 8/9.
 1. Set upper attachment into upper keyway on forward beam.
 2. At aft end, rotate basket or step to engage lower forward attachment in lower keyway.

3. Pull basket or step aft and raise until lower attachment fitting hits stop over keyway. Push fitting into keyway and slide down until locked.

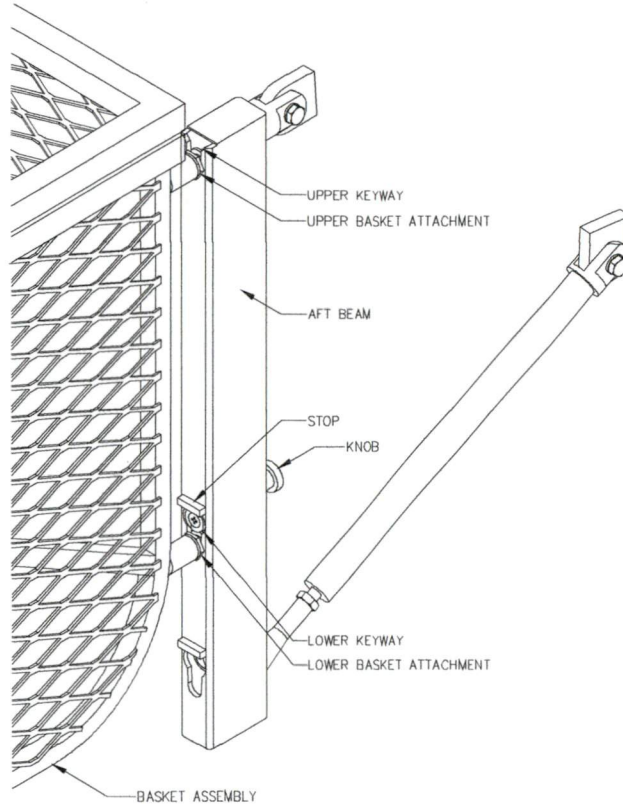


Figure 9 – Aft Basket Attachment (1006 Configuration)

2. Removal - Refer to Figure 8/9.
 1. Pull knob at bottom end of aft beam and lift basket or step until lower attachment fitting is free of keyway. Slide basket or step forward until lower forward attachment is disengaged from keyway. Lower aft end to ground.
 2. At forward end, rotate basket or step up and slide forward until upper attachment fitting is free of keyway.

Flight Test Report

Aero Design Basket on B212

Prairie Northern Region

Test Aircraft Registration: C-GWWL

Aircraft Serial Number: 30702

Test Configuration:

Configuration was standard for type with low skid gear and dual cargo mirror. The aircraft was flown in three different configurations:

1 – No Basket installed; T/O gross weight 9745 lbs, longitudinal CG 141.7 in, lateral CG 1.1 in.

2 – Basket installed on right side with 100 lbs of load in the basket; T/O gross weight 9760 lbs, longitudinal CG 140.7 in (Aft), lateral CG 2.5 in. The aircraft was also flown with 267 lbs of load in the basket and no load in the basket for a qualitative assessment of vibrations and controllability.

3 – Basket installed on left side with 100 lbs of load in the basket; T/O gross weight 9760 lbs, longitudinal CG 140.7 in, lateral CG -0.3 in. The aircraft was also flown with 267 lbs of load in the basket and no load in the basket for a qualitative assessment of vibrations and controllability.

Original basis of certification: CAR 7 as per TCDS

The modified aircraft was examined against the requirements of: CAR 529.

Flight Authority: Flight Permit (Experimental)

Personnel involved were: *Michel Brulotte (AARDC), and Trent Lemke (Ascent Helicopters).*

The subject aircraft was test flown by Michel Brulotte from Transport Canada on 14 November 2014.

Flight tests were conducted west of Qualicum Beach Airport the prevailing temperatures were -2 to +7 C, test pressure altitudes were between 500 and 6500 feet.

TEST PROGRAM

The following tests were performed:

- Normal Pre-flight Checks
- Hover and Low Speed Controllability
- Determination of Maximum Level Flight Airspeed
- Take-off power climb
- Controllability in Forward Flight and at V_{NE}
- Flight at V_D ($1.11 \cdot V_{NE}$)
- Static Longitudinal Stability in Cruise Flight, in MCP Climb, and in Autorotation
- Static Directional Stability in Cruise Flight and in MCP Climb
- Autorotation Entries
- Performance Climbs AEO

DISCUSSION – Flight Characteristics and Performance

The basket structural tests resulted in a localized basket structural failure due to a test rig failure. The limit load was set to 267 lbs and the limit demonstration speed was set to 127 KIAS until the basket structural test can be completed without failure.

Low Speed Controllability – Low speed controllability was qualitatively assessed in ground effect at speeds up to approximately 20 knots. There were no noticeable differences between the modified and unmodified configurations.

Maximum Level Flight Airspeed V_H – The maximum level flight airspeed was found to be 105 KIAS with the basket installed on the left or right side and was 114 KIAS (limited by V_{NE}) with no basket installed, the power required for the basic aircraft without the basket installed was 75% Torque.

Controllability at V_{NE} – The modified aircraft was flown at the basic aircraft V_{NE} (114 KIAS) with maximum continuous power. There were adequate control margins in level flight and in turns up to 30 degrees of bank. There was no difference noted for controllability between the modified and unmodified configurations. The longitudinal control position was slightly forward when no basket was installed, which met the FAA mast bending criteria.

Flight at Demonstration Speed ($1.11 \cdot V_{NE}$) – The aircraft was flown at speeds up to 127 KIAS using maximum continuous power. There were no unusual aircraft vibrations or handling characteristics noted at V_D .

Static Longitudinal Stability – The static longitudinal stability was assessed for the three configurations under the following conditions: Climb ($V_{NE} - 10$ and $0.8 V_H$), Cruise, and Autorotation (Best Range Speed and Minimum Rate of Descent Speed). The static longitudinal stability was found to be positive for all the conditions flown. There were no noticeable differences between the modified and unmodified configurations.

Steady Heading Side Slips – The static lateral directional stability was assessed for the three configurations under the following conditions: Climb, and Cruise. The static lateral directional stability of the aircraft was assessed by performing Steady Heading Side-

Slips. The static lateral directional stability was positive in climb and cruise conditions. There were no noticeable differences between the modified and unmodified configurations.

Performance Climbs – Performance climbs were performed at 58 KIAS in the modified and unmodified configurations using maximum continuous power. There was a 250 ft/min reduction in rate of climb with a basket installed vice with no basket installed.

Controllability after Engine Failure – The controllability after sudden engine failure was assessed for the three configurations. Engine failures were simulated by rapidly reducing the throttles to idle, waiting at least one second and then reducing the collective at speeds between 50 and 114 KIAS (Modified aircraft target V_{NE}) for the modified aircraft. There was no unusual aircraft behaviour upon entry into autorotation.

RECOMMENDATIONS

Based on flight test results the Aero Design Basket modification is recommended for approval on B205, and B212 aircraft with the following limitations:

VFR Only

Only one basket be installed on the aircraft, on either the left or right side.

Maximum V_{NE} is 114 KIAS, or basic aircraft V_{NE} , whichever is lowest.

Maximum load in the basket is 267 lbs.

Operating Procedures

The crew should ensure that the load is secured in the basket and that the basket is securely closed prior to flight.

The following performance information must be included in the Flight Manual Supplement:

Cruise performance, and range will be reduced by approximately 10 percent with the Basket installed.

Climb performance will be reduced by 250 fpm.

FURTHER TESTING

If Aerodesign decides to expand the basket cargo weight limit after successful completion of the basket structural tests then the following flight tests must be completed:

Hover and Low Speed controllability at speeds up to 20 knots – Ensure adequate control margins.

Controllability in climb at power up to Take-off power – Ensure adequate control margins.

Controllability at V_{NE} , including turns of up to 30 degrees of bank left and right – Ensure adequate control margins.

Flight at V_D (127 KIAS) – Ensure no objectionable vibrations.

Controllability in autorotation, including entry – Ensure adequate control margins.

If Aerodesign decides to expand the V_{NE} envelope beyond 114 KIAS for the basket then it is recommended that a qualified test pilot conduct the tests.



Transport
Canada

Transports
Canada

Canada

AGREEMENT FOR RECOVERING THE INCREMENTAL COSTS OF PROVIDING
THE SERVICES INSIDE/OUTSIDE CANADA

THIS AGREEMENT made between:

HER MAJESTY IN RIGHT OF CANADA, represented herein by the Minister of Transport, hereinafter called "the Minister",

OF THE FIRST PART

-and-

Aero Design Ltd.

a body corporate duly incorporated, hereinafter called "the
Applicant",

OF THE SECOND PART

WHEREAS the Applicant will request from time to time that the Minister perform services, inside/outside Canada, for which there is no charge listed in Subpart 104 (Charges) of the *Canadian Aviation Regulations* (CARs) or which are outside of the department's basic level of service.

WITNESSES that in consideration of the mutual covenants herein contained:

1. The Minister shall provide the Applicant with the requested services at a time and place to be mutually agreed.
2. The Applicant shall be liable for transportation, lodging, meals, and incidental expenses. These travel-related costs will be calculated in accordance with the *Treasury Board Manual*, Personnel Management Component, Employee Services, Chapter 1.1 in effect at the time. Payments must be made in full and in Canadian funds to the Receiver General for Canada upon being invoiced.
3. Except where otherwise agreed by the Minister, the Applicant shall also be liable for the overtime costs of performing services or traveling to perform services on weekdays, whenever the total duty time for that day exceeds 7.5 hours and on Saturdays, Sundays and Canadian statutory holidays. These overtime costs will be calculated in accordance with the appropriate collective agreement(s) in effect at the time. Payments must be made in full and in Canadian funds to the Receiver General for Canada upon being invoiced.
4. Upon request, the Minister will notify the Applicant of the estimated cost in advance of providing the services.
5. The Minister and the Applicant may terminate this Agreement by giving reasonable notice to the other Party.
6. No member of the House of Commons shall be admitted to any share or part of this Agreement, or to any benefit to arise therefrom.

Description of Service to be Provided

Transport Canada Flight Test services in support of STC SH07-56 reissue. (NAPA file c-14-0978.)

IN WITNESS WHEREOF the Parties hereto have executed this Agreement this 17 day of Oct 2014.


Applicant

F.J.B. Wright
Regional Manager, Aircraft Certification
or Minister of Transport

RDIMS #1174173

Table F-1

Statement of Suitability for Flight Test

Aircraft Type/Model: Bell 212

Registration: C-GWWL

Serial Number: 30702

Description of Design Change(s):

Installation of Aero Design Ltd. Mega Cargo Basket/s iaw drawings 100601 and/or 100602 and mounting provisions iaw drawings 1006605 and 100606 as applicable after modifications to the Fwd & Aft Beams as noted below.

Statement of Suitability for Flight Test:

This is to certify that I have reviewed the subject design change and that I have reasonable assurance that compliance could be found with all applicable design requirements, except for those requirements that shall be substantiated by flight testing. I consider the aircraft to be safe for flight.

Subject to the following limitations: Max Payload 267 Lbs and Vd = 127 knots

Authorized Person: 

Date:

NOV 11 2014

(This information can be sent by mail or electronically)

Required Modifications to Fwd & Aft Beams

Weld in a 1/8" thick 304SS cover plate complete with a centrally located 1/4" diameter drain hole to the bottom end of:

Fwd Beam PN's; 100632-01-01 & 02 and

Aft Beam PN's; 100631-01-01 & 02 100633-01-01 & 02

Transport Canada Transports Canada

Civil Aviation Aviation Civile

Aircraft Maintenance & Manufacturing
Victoria Transport Canada Centre
103 – 1962 Canso Road
North Saanich, B.C. V8L 5V5

Your file Votre référence

Our file Notre référence

5008-GWWL
RDIMS: 10103191

November 7, 2014

Ascent Helicopters Ltd.
1550 Springhill Road
Parksville, BC
V9P 2T2

Subject: Specific Purpose Flight Permit

Registration: C-GWWL
 Manufacturer: Bell Helicopter Textron
 Model: B212
 Serial: 30702

This letter constitutes a Specific Purpose Flight Permit for the aircraft identified above. This Permit is valid from **November 10, 2014** to **December 10, 2014** and is issued subject to the following conditions:

1. Valid for the purpose of flight testing the Aero Design Ltd. Quick Release Cargo Basket. Test flights shall be conducted in accordance with the Aero Design Flight Test Plan FTP1006.03, Revision 0, dated 10 October 2014, or later accepted revision.
2. Use as a commercial aircraft is prohibited.
3. Crew members only, no passengers except those persons whom the pilot-in-command determines as having a necessary function in the test flight(s) and where that person is essential to the flight. Passenger carrying is prohibited.
4. Maximum permissible take-off weight not to exceed 5079 kgs.
5. Flight into known or predicted icing conditions prohibited.
6. All test flights shall be conducted under Day VFR conditions only.
7. Flight over built-up areas prohibited.
8. This Flight Permit shall form part of the permanent aircraft technical record. A copy of this Flight Permit shall be carried on board the aircraft at all times.
9. Flight Manual Supplement FMS751.91 (Rev2), or later accepted revision, shall be carried on board the aircraft at all times.

Canada^{🇨🇦}

10. If necessary the Controlling Air Traffic Control unit must be informed of the test program prior to flight.
11. If necessary the permission of the Foreign Aviation Authority is required prior to flight in their airspace.
12. Unless suspended, surrendered or cancelled, this Flight Permit is valid until 23:59hrs on December 10th, 2014.

For the Minister

A handwritten signature in black ink, appearing to read 'Michael Godsell', with a long horizontal stroke extending to the right.

Michael Godsell
Civil Aviation Safety Inspector - Airworthiness
Victoria Transport Canada Centre
Tel: 250 363 6626

Table F-1

Statement of Suitability for Flight Test

Aircraft Type/Model: Bell 212

Registration: C-GWWL

Serial Number: 30702

Description of Design Change(s):

Installation of Aero Design Ltd. Mega Cargo Basket/s iaw drawings 100601 and/or 100602 and mounting provisions iaw drawings 1006605 and 100606 as applicable after modifications to the Fwd & Aft Beams as noted below.

Statement of Suitability for Flight Test:

This is to certify that I have reviewed the subject design change and that I have reasonable assurance that compliance could be found with all applicable design requirements, except for those requirements that shall be substantiated by flight testing. I consider the aircraft to be safe for flight.

Subject to the following limitations: Max Payload 267 Lbs and Vd = 127 knots

Authorized Person: 

Date:

NOV 11 2014

(This information can be sent by mail or electronically)

Required Modifications to Fwd & Aft Beams

Weld in a 1/8" thick 304SS cover plate complete with a centrally located 1/4" diameter drain hole to the bottom end of:

Fwd Beam PN's; 100632-01-01 & 02 and

Aft Beam PN's; 100631-01-01 & 02 100633-01-01 & 02

Jeff Clarke

From: Brulotte, Michel [michel.brulotte@tc.gc.ca]
Sent: November 12, 2014 3:11 PM
To: Jeff Clarke; Staal, Jack
Subject: RE: Flight test

Jeff,

Just give me a call when the conformity is complete and I can be there in an hour.

Thanks,

Michel
613-220-8221

From: Jeff Clarke [jeff@aerodesign.ca]
Sent: November 12, 2014 2:20 PM
To: Brulotte, Michel; Staal, Jack
Subject: RE: Flight test

I think we should be fine to start in the afternoon. The installation is not particularly complicated so I don't expect the conformity to take a great deal of time.

Jeff

-----Original Message-----

From: Brulotte, Michel [mailto:michel.brulotte@tc.gc.ca]
Sent: November 12, 2014 11:00 AM
To: Staal, Jack; 'Jeff Clarke'
Subject: RE: Flight test

Do you want us to start TC flights in the afternoon or should we delay until 14th at 0800?

Thanks,

Michel

From: Staal, Jack
Sent: November 12, 2014 10:37 AM
To: 'Jeff Clarke'; Brulotte, Michel
Subject: FW: Flight test

Michel

Information.

Jack

From: Jeff Clarke [mailto:jeff@aerodesign.ca]
Sent: Friday, November 07, 2014 4:06 PM
To: Staal, Jack
Subject: RE: Flight test

Shawn has confirmed he will arrive at Ascent between 9-10AM on the 13th.

From: Staal, Jack [mailto:Jack.Staal@tc.gc.ca]
Sent: November 7, 2014 1:30 PM
To: 'Jeff Clarke'
Subject: RE: Flight test

I fly out the 16th at the latest.

From: Jeff Clarke [mailto:jeff@aerodesign.ca]
Sent: Friday, November 07, 2014 2:30 PM
To: Staal, Jack
Subject: RE: Flight test

Hi Jack,

Will do.

Shawn Johnson emailed me this morning that he may not be available on the 12th, but will be out first thing on the 13th instead. Expecting confirmation from him by end of day. How long are you in town? Will you have a chance to come to our shop in Powell River?

Regards,
Jeff

From: Staal, Jack [mailto:Jack.Staal@tc.gc.ca]
Sent: November 7, 2014 12:53 PM
To: 'Jeff Clarke'; Brulotte, Michel
Subject: Flight test

Jeff

I will be looking for your DAR's signoff on the "Statement of Suitability for Flight Test".

Reference SI521-004 attachments.

Sincerely

J.H. (Jack) Staal
Aircraft Certification Technologist | Technologue, Certification des aeronefs.
Engineering | Ingénierie
Prairie and Northern Region | Region des Prairies et du Nord Edmonton Operations |
Edmonton opérations
(780)495-5227 |Facs/ telec: (780)495-6659 (note recent fax change)
jack.staal@tc.gc.ca<mailto:jack.staal@tc.gc.ca>
Transport Canada | 1100-9700 Jasper Ave | Edmonton | Ab T5J-4E6 (RAXI) Transports
Canada | 1100-9700 av. Jasper | Edmonton | Ab T5J-4E6 (RAXI) Government of Canada |
Gouvernement du Canada To provide feedback to TCCA, use CAIRS.
See: <http://www.tc.gc.ca/CivilAviation/ManagementServices/QA/cairs.htm>
Pour tout commentaire à TCAC, utiliser CAIRS.
Voir: <http://www.tc.gc.ca/AviationCivile/ServicesdeGestion/AQ/ssqac.htm>

Jeff Clarke

From: Maureen Crockett [mcrockett@dt-avn.com]
Sent: November 7, 2014 4:01 PM
To: Peter McDonald
Cc: Al Hansson; Trent Lemke; jeff@aerodesign.ca
Subject: Re: Coverage for Flight while on a Transport Canada issued Flight Permit

Thanks for the information. Confirm coverage on the aircraft is in place.

Sent from my iPhone

On Nov 7, 2014, at 5:10 PM, "Peter McDonald" <pmcdonald@ascentheli.ca> wrote:

Good Afternoon Maureen,

I am contacting you for confirmation that our aircraft, Bell 212, S/N 30702, C-GWWL will be fully insured, while we are operating under a Transport Canada Flight Permit.

This Flight Permit is issued to allow us to carry out a Flight Test program, on behalf of Aero Design Ltd., to help them attain Transport Canada Approval for their "Quick Release Cargo Basket". I have attached a copy of the flight test plan for your reference.

I have just had verbal approval from Transport Canada, saying the Flight Permit will be Issued on Wednesday, November 12, 2014 and we hope to begin the test flights the next day.

Don't hesitate to call myself or Al if you require further information.

Cheers

Peter

Peter McDonald

PRM

Ascent Helicopters Ltd.

1550 Springhill Road

Parksville, BC V9P 2T2

Phone: (250) 752-2981

Fax: (250) 752-2983

Cell: (250) 668-8593

Email: pmcdonald@ascentheli.ca

<FTP1006.03_0.pdf>

07/11/2014

AERO DESIGN
HIGH, R/H.

Weight And Balance Report

Page 2/2

A/C Reg	A/C S/N	Model	Configuration	Date	Report No.
C-GWWL	30702	BH212	NORMAL	22-Apr-12	Orig

Longitudinal C.G weighed $\frac{1136189.1}{7914.0} = 143.57$

Lateral C.G. weighed $\frac{12563.2}{7914.0} = 1.59$

Empty Weight Configuration	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
As Weighed	7914.0	143.57	1136189.1	1.59	12563.2
useable engine oil	-24.5	169.10	-4143.0	0.00	0.0
station A ballast	-20.3	-4.50	91.4	20.00	-406.0
unusable fuel	0.0	142.80	0.0	0.00	0.0
undrainable engine oil	0.0	167.00	0.0	0.00	0.0
station B ballast	0.0	-4.50	0.0	-20.00	0.0
ground handling lugs	-4.4	144.50	-635.8	0.00	0.0
RAP operational equipment	-144.1	155.70	-22436.4	5.00	-720.5
			0.0		0.0
Empty Weight	7720.7	143.65	1109065.3	1.48	11436.7

Reference Form "C" For Current Weight and Balance

Most Aft C of G	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Empty Weight 14 Nov. 2014	6887.2	144.92	998076.1	1.91	7193.5
pilot	170.0	47.00	7990.0	22.00	3740.0
engine oil	24.5	169.10	4143.0	0.00	0.0
fuel	1474.0	152.60	224932.4	0.00	0.0
RAP operational equipment	-144.1	155.70	-22436.4	5.00	-720.5
			0.0		0.0
Total	8411.6	144.17	1212705.1	1.21	10213.0

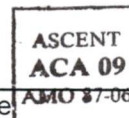
Most Forward C of G	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Empty Weight 14 Nov. 2014	6887.2	144.92	998076.1	1.91	7193.5
pilot / copilot	340.0	47.00	15980.0	0.00	0.0
most forward fuel	534.0	127.60	68138.4	0.00	0.0
passenger, fwd (2)	340.0	87.00	29580.0	15.00	5100.0
engine oil	24.5	169.10	4143.0	0.00	0.0
RAP operational equipment	-144.1	155.70	-22436.4	5.00	-720.5
Total	7981.6	137.00	1093481.1	1.45	11573.0

The above maintenance has been performed in accordance with the applicable airworthiness requirements

Nov. 14 / 14
Date

[Signature]
Signature

317275
AMO / License



Weight And Balance Record

FORM "C"

A/C Reg	A/C S/N	Model	Configuration
C-GWWL	30702	BH212	TANK

Page
8

Date	Item No		Description of Article or Modification	Added (+)			Removed (-)			Basic Aircraft		
	In	Out		Weight	Arm lg	Arm lat	Weight	Arm lg	Arm lat	Weight	Long. C of G	Lat. C of G
28-Sep-14			empty weight carried fwd.	-	-	-	-	-	-	6617.7	145.69	1.67
28-Sep-14	x		Dart Skid Tubes	79.2	109.20	0.00				6696.9	145.26	1.65
28-Sep-14	x		Onboard Cargo Hook	29.6	140.20	0.00				6726.5	145.24	1.65
28-Sep-14	x		RH Dart Folding Step (-14)	13.3	119.70	48.80				6739.8	145.18	1.74
28-Sep-14	x		Skid Guard RH OB D205-665-01	4.8	118.70	60.00				6744.6	145.17	1.78
28-Oct-14	x		40 Gallon Auxiliary Fuel Tanks	40.5	149.70	0.00				6785.1	145.19	1.77
3-Nov-14	x		Auxiliary Hydraulic System	84.1	138.0	-6.0				6869.2	145.11	1.68
13-Nov-14		x	RH Dart Folding Step (-14)				13.3	119.70	48.80	6855.9	145.15	1.58
13-Nov-14		x	Goodrich hoist				102.7	130.10	48.20	6753.2	145.38	0.88
14-Nov-14	x		A-D Ski Basket Provisions L/H	11.2	119.61	-45.84				6764.4	145.34	0.80
14-Nov-14	x		A-D Ski Basket Provisions R/H	11.6	124.55	45.88				6776.0	145.30	0.88
14-Nov-14	x		A-D Ski Basket (High), R/H	111.2	121.31	64.69				6887.2	144.92	1.91
14-Nov-14	THE MAINTENANCE DESCRIBED ABOVE HAS BEEN PERFORMED IN ACCORDANCE WITH THE APPLICABLE											
	AIRWORTHINESS REQUIREMENTS.											
	<i>Peter M. [Signature]</i>											
0-Jan-00												

ASCENT
ACA 09
AMO 87-06

[illegible]

NORMAL CONFIG.
NO BASKET.

Weight And Balance Report

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A/C Reg	A/C S/N	Model	Configuration	Date	Report No.
C-GWWL	30702	BH212	NORMAL	22-Apr-12	Orig

Longitudinal C.G weighed $\frac{1136189.1}{7914.0} = 143.57$

Lateral C.G. weighted $\frac{12563.2}{7914.0} = 1.59$

Empty Weight Configuration	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
As Weighed	7914.0	143.57	1136189.1	1.59	12563.2
useable engine oil	-24.5	169.10	-4143.0	0.00	0.0
station A ballast	-20.3	-4.50	91.4	20.00	-406.0
unusable fuel	0.0	142.80	0.0	0.00	0.0
undrainable engine oil	0.0	167.00	0.0	0.00	0.0
station B ballast	0.0	-4.50	0.0	-20.00	0.0
ground handling lugs	-4.4	144.50	-635.8	0.00	0.0
RAP operational equipment	-144.1	155.70	-22436.4	5.00	-720.5
			0.0		0.0
Empty Weight	7720.7	143.65	1109065.3	1.48	11436.7

Reference Form "C" For Current Weight and Balance

Most Aft C of G	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Empty Weight 13 Nov. 2014	6753.2	145.38	981802.0	0.88	5911.3
pilot	170.0	47.00	7990.0	22.00	3740.0
engine oil	24.5	169.10	4143.0	0.00	0.0
fuel	1474.0	152.60	224932.4	0.00	0.0
RAP operational equipment	-144.1	155.70	-22436.4	5.00	-720.5
			0.0		0.0
Total	8277.6	144.54	1196431.0	1.08	8930.8

Most Forward C of G	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Empty Weight 13 Nov. 2014	6753.2	145.38	981802.0	0.88	5911.3
pilot / copilot	340.0	47.00	15980.0	0.00	0.0
most forward fuel	534.0	127.60	68138.4	0.00	0.0
passenger, fwd (2)	340.0	87.00	29580.0	15.00	5100.0
engine oil	24.5	169.10	4143.0	0.00	0.0
RAP operational equipment	-144.1	155.70	-22436.4	5.00	-720.5
Total	7847.6	137.27	1077207.0	1.31	10290.8

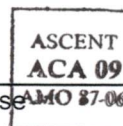
The above maintenance has been performed in accordance with the applicable airworthiness requirements

Nov. 13, 2014
Date

P. M. M.
Signature

317275

AMO / License

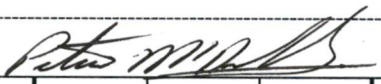


Weight And Balance Record

FORM "C"

A/C Reg	A/C S/N	Model	Configuration
C-GWWL	30702	BH212	TANK

Page
8

Date	Item No		Description of Article or Modification	Added (+)			Removed (-)			Basic Aircraft		
	In	Out		Weight	Arm lg	Arm lat	Weight	Arm lg	Arm lat	Weight	Long. C of G	Lat. C of G
28-Sep-14			empty weight carried fwd.	-	-		-	-		6617.7	145.69	1.67
28-Sep-14	x		Dart Skid Tubes	79.2	109.20	0.00				6696.9	145.26	1.65
28-Sep-14	x		Onboard Cargo Hook	29.6	140.20	0.00				6726.5	145.24	1.65
28-Sep-14	x		RH Dart Folding Step (-14)	13.3	119.70	48.80				6739.8	145.18	1.74
28-Sep-14	x		Skid Guard RH OB D205-665-01	4.8	118.70	60.00				6744.6	145.17	1.78
28-Oct-14	x		40 Gallon Auxiliary Fuel Tanks	40.5	149.70	0.00				6785.1	145.19	1.77
3-Nov-14	x		Auxiliary Hydraulic System	84.1	138.0	-6.0				6869.2	145.11	1.68
13-Nov-14		x	RH Dart Folding Step (-14)				13.3	119.70	48.80	6855.9	145.15	1.58
13-Nov-14		x	Goodrich hoist				102.7	130.10	48.20	6753.2	145.38	0.88
13-Nov-14	THE MAINTENANCE DESCRIBED ABOVE HAS BEEN PERFORMED IN ACCORDANCE WITH THE APPLICABLE ASCENT											
	AIRWORTHINESS REQUIREMENTS.-----											
												
0-Jan-00												

ASCENT
ACA-09
AMO 87-06

[illegible]

Weight And Balance Report

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A/C Reg	A/C S/N	Model	Configuration	Date	Report No.
C-GWWL	30702	BH212	NORMAL	22-Apr-12	Orig

Longitudinal C.G weighed $\frac{1136189.1}{7914.0} = 143.57$

Lateral C.G. weighted $\frac{12563.2}{7914.0} = 1.59$

Empty Weight Configuration	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
As Weighed	7914.0	143.57	1136189.1	1.59	12563.2
useable engine oil	-24.5	169.10	-4143.0	0.00	0.0
station A ballast	-20.3	-4.50	91.4	20.00	-406.0
unusable fuel	0.0	142.80	0.0	0.00	0.0
undrainable engine oil	0.0	167.00	0.0	0.00	0.0
station B ballast	0.0	-4.50	0.0	-20.00	0.0
ground handling lugs	-4.4	144.50	-635.8	0.00	0.0
RAP operational equipment	-144.1	155.70	-22436.4	5.00	-720.5
			0.0		0.0
Empty Weight	7720.7	143.65	1109065.3	1.48	11436.7

Reference Form "C" For Current Weight and Balance

Most Aft C of G	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Empty Weight 14 Nov. 2014	6887.2	144.91	998041.6	-0.18	-1263.4
pilot	170.0	47.00	7990.0	22.00	3740.0
engine oil	24.5	169.10	4143.0	0.00	0.0
fuel	1474.0	152.60	224932.4	0.00	0.0
RAP operational equipment	-144.1	155.70	-22436.4	5.00	-720.5
			0.0		0.0
Total	8411.6	144.17	1212670.6	0.21	1756.1

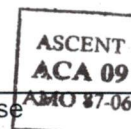
Most Forward C of G	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Empty Weight 14 Nov. 2014	6887.2	144.91	998041.6	-0.18	-1263.4
pilot / copilot	340.0	47.00	15980.0	0.00	0.0
most forward fuel	534.0	127.60	68138.4	0.00	0.0
passenger, fwd (2)	340.0	87.00	29580.0	15.00	5100.0
engine oil	24.5	169.10	4143.0	0.00	0.0
RAP operational equipment	-144.1	155.70	-22436.4	5.00	-720.5
Total	7981.6	137.00	1093446.6	0.39	3116.1

The above maintenance has been performed in accordance with the applicable airworthiness requirements

Nov. 14, 2014
Date


Signature

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Weight And Balance Record

FORM "C"

A/C Reg	A/C S/N	Model	Configuration
C-GWWL	30702	BH212	TANK

Page
8

Date	Item No		Description of Article or Modification	Added (+)			Removed (-)			Basic Aircraft		
	In	Out		Weight	Arm lg	Arm lat	Weight	Arm lg	Arm lat	Weight	Long. C of G	Lat. C of G
28-Sep-14			empty weight carried fwd.	-	-		-	-		6617.7	145.69	1.67
28-Sep-14	x		Dart Skid Tubes	79.2	109.20	0.00				6696.9	145.26	1.65
28-Sep-14	x		Onboard Cargo Hook	29.6	140.20	0.00				6726.5	145.24	1.65
28-Sep-14	x		RH Dart Folding Step (-14)	13.3	119.70	48.80				6739.8	145.18	1.74
28-Sep-14	x		Skid Guard RH OB D205-665-01	4.8	118.70	60.00				6744.6	145.17	1.78
28-Oct-14	x		40 Gallon Auxiliary Fuel Tanks	40.5	149.70	0.00				6785.1	145.19	1.77
3-Nov-14	x		Auxiliary Hydraulic System	84.1	138.0	-6.0				6869.2	145.11	1.68
13-Nov-14		x	RH Dart Folding Step (-14)				13.3	119.70	48.80	6855.9	145.15	1.58
13-Nov-14		x	Goodrich hoist				102.7	130.10	48.20	6753.2	145.38	0.88
14-Nov-14	x		A-D Ski Basket Provisions L/H	11.2	119.61	-45.84				6764.4	145.34	0.80
14-Nov-14	x		A-D Ski Basket Provisions R/H	11.6	124.55	45.88				6776.0	145.30	0.88
14-Nov-14	x		A-D Ski Basket (Low), L/H	111.2	121.00	-64.69				6887.2	144.91	-0.18
14-Nov-14	THE MAINTENANCE DESCRIBED ABOVE HAS BEEN PERFORMED IN ACCORDANCE WITH THE APPLICABLE											
	AIRWORTHINESS REQUIREMENTS.											
0-Jan-00												

[illegible]

Submitted for review ?? Nov 2014
Produced at conformity inspection 13 Nov 2014
Submitted for review 05/06 Nov 2014

Number	Title	Rev	Chg	Chg	Description of changes from original submitted Rev. 0
	all drawings all drawings				added "Mega" to cargo basket in title blocks ? added review date to drawings
DCL1006-1	Document Control List - Basket Installation	0			(not submitted)
✓ 100601	Cargo Basket Installation - Standard Lid	0		A	sht. 1 - Item 9 description updated to incl. "STANDARD LID" sht. 3 - weight and balance updated
✓ 100602	Cargo Basket Installation - Extended Lid	0		A	sht. 3 - weight and balance updated
✓ 100640	Access Step Modification		0	A A	sht. 1 - end hoop hardware added sht. 2 added with weight and balance
FMS751.90	Flight Manual Supplement - Cargo Basket	2			(draft)
ICA751.91	Instructions for Continued Airworthiness - Cargo Basket	0			(not submitted)
DCL1006-2	Document Control List - Mounting Provisions Installation	0			(not submitted)
✓ 100605	Mounting Provisions Installation - Low Configuration	0	A	B B B B B B B	sht. 2 - alternate nuts added sht. 1 - 100635-12/-13 bushings replace 100635-04 bushing sht. 1 - AN4-12A bolt changed to AN4-11A sht. 1 - AN5-12A bolt changed to AN5-11A sht. 1 - AN43B-10A bolt changed to AN43B-6A sht. 1 - washer qty's corrected sht. 2 - AN45-7A with bushing added as alt. to AN45-4A sht. 2 - weight and balance updated
✓ 100606	Mounting Provisions Installation - High Configuration	0	A	B B	sht. 2 - alternate nuts added same changes as 100605 detail view locations added
ICA751.91	Instructions for Continued Airworthiness - Cargo Basket	0			(not submitted)

Number	Title	Rev	Chg	Chg	Description of change
DCL 1006-11	Document Control List - Basket Assembly	0			(not submitted)
✓ 100610	Cargo Basket Assembly	0		A	no changes
✓ 100611	Basket Fabrication	0		A	title block changed to list Bell models
				A	bill of materials - added qty to item 10
				A	increase font size of "DETAIL B"
✓ 100612	Standard Lid Fabrication	0		A	no changes
✓ 100613	Extended Lid Fabrication	0		A	title block changed to list Bell models
				A	items 12/13 swapped to match bill of materials
				A	bushing holes added to right foot step cutout
				A	detail D - added drill note for bushings
				A	detail D - added bolts when cover not installed
				A	tolerance corrected on far right bay dimension
✓ 100616	Filler Sheets	0		A	no changes
✓ 100620	Basket Hoop	0		A	Item 02 label added
✓ 100621	Basket End Hoop	0	A		optional step provisions added
			B		item ballon 07 changed to 04 (typo)
			B		bushing (item 4) added to drawing
			B		drill and welding specs for bushing (item 4) added
✓ 100622	Basket Attachment Hoop	0	A		optional step provisions added
			B		title block changed to list Bell models
			B		drill spec for studs added
✓ 100623	Standard Lid End Hoop	0		A	no changes
✓ 100624	Standard Lid Hoop	0		A	no changes
✓ 100625	Extended Lid End Hoop	0		A	no changes
✓ 100626	Extended Lid Hoop	0		A	no changes
✓ 100627	Basket Components - Placard	0		A	add "SERIES" to models in title block
✓ 100650	Access Step Fabrication		0	A	Notes added
			A		welding symbol added to cap (05)
			A		welding symbol added to round tube/square tube interface
(The following are components common to all baskets - unchanged from approval SH08-16 Issue 5)					
49215	Basket Components - Spacer	1			(not submitted)
49216	Basket Components - Spacer	1			(not submitted)
84240	Lid Brace Installation	0			(not submitted)
84255	Handle Assembly	2			(not submitted)
84261	Handle Bar Assembly	2			(not submitted)
84262	Basket Handle Provisions Assembly	2			(not submitted)
84263	Lid Handle Provisions Assembly	0			(not submitted)
84265	Handle Lever	2			(not submitted)
84267	Handle Bracket	1			(not submitted)
84272	Bushing	1			(not submitted)

Revision 0

24 November 2014

Number	Title	Rev	Chg	Chg	Description of change
DCL1006-11	Document Control List - Basket Assembly (continued)	0			
36273	Lid Bracket	2			(not submitted)
36274	Bushing	3			(not submitted)
36275	Bushing	4			(not submitted)
36277	Handle Bar	1			(not submitted)
36278	Spring	3			(not submitted)
36280	Brace	3			(not submitted)
ER1006.01	Engineering Report - Basket Installation	0			draft submitted 10 Nov 2014
TR1006.02	Engineering Report - Load Test	0			draft submitted 10 Nov 2014, accepted by Jack 12 Nov 2014
FTP1006.03	Flight Test Plan and Report	0			draft submitted 5 Nov 2014, accepted by Michel 6 Nov 2014
	Flight Test Report – Transport Canada	--			received 18 Nov 2014
DCL1006-12	Document Control List - Mounting Provisions Fabrication	0			(not submitted)
100630	Forward Beam Fabrication (Low Mount)	0	A	B	bracket (05) modified, cap (07) added - per DAR requirement welding rod corrected to ER308L top view corrected to show slot in upper guide (09/10)
100631	Aft Beam Fabrication (Low Mount)	0	A	B	bracket (06) modified, cap (07) added - per DAR requirement welding rod corrected to ER308L item ballon 06 corrected to 05
100632	Forward Beam Fabrication (High Mount)	0	A	B	bracket (05) modified, cap (07) added - per DAR requirement welding rod corrected to ER308L top view corrected to show slot in upper guide (09/10)
100633	Aft Beam Fabrication (High Mount)	0	A	B	bracket (06) modified, cap (07) added - per DAR requirement top view of beam corrected to show modified bracket (06) welding rod corrected to ER308L
100635	Strut Fabrication	0	A	B	bushings (12+13) added drag link (03) length increased to 22.25 bushing (14) added (for use with AN45-7A eyebolt)
ER1006.01	Engineering Report - Basket Installation	0			draft submitted 10 Nov 2014
TR1006.02	Engineering Report - Load Test	0			draft submitted 10 Nov 2014, accepted by Jack 12 Nov 2014

CONFORMITY INSPECTION RECORD – Load Test Articles

Applicant Aero Design Ltd.	Aeronautical Product				Title of Change Cargo Basket Installation (1006 Configuration)
	Make	Model	Serial No.	Registration	
	Bell	212			
Drawing No.	Applicant's Inspector Signature Date		T.C. Inspection Signature Date		Findings
100610, Rev. 0A P/N 100610-02 (Basket, Ext. Lid)	JH Chk. 03 Dec 2014				
100630, Rev. 0B P/N 100630-01-01 (Low LH Fwd Beam)	JH Chk. 03 Dec 2014				
100631, Rev. 0B 100631-01-01 (Low LH Aft Beam)	JH Chk. 03 Dec 2014				
100635, Rev. 0B 100635-01, -02, -03 (Struts, drag link)	JH Chk. 03 Dec 2014				

APPLICANT'S ATTESTATION

I hereby confirm that the prototype installation for the subject

☒ MODIFICATION,

☐ REPAIR,

☐ TSO/AP-TC ARTICLE

is in conformity with the applicable installation drawing(s) listed above
and that necessary ground tests have been carried out.
[Please check (✓) the applicable box.]

Additional Information:

No components are painted/powder coated as specified – does not affect structural test.

Signature: JH Chk.

TC INSPECTION

☐ ACCEPTABLE

☐ UNACCEPTABLE

Remarks:

Signature: _____

CONFORMITY INSPECTION RECORD – Flight Test Articles

Applicant Aero Design Ltd.	Aeronautical Product				Title of Change Cargo Basket Installation (1006 Configuration)
	Make Bell	Model 212	Serial No.	Registration	
Drawing No.	Applicant's Inspector Signature Date		T.C. Inspection Signature Date		Findings
100610, Rev. 0A P/N 100610-02 (Basket, Extended Lid) S/N 100602-01	<i>Olasa Kehu</i> M795441 Dec 1/14				
100630, Rev. 0B P/N 100630-01-01 (Low LH Fwd Beam)	<i>Olasa Kehu</i> M795441 Dec 1/14				
100631, Rev. 0B P/N 100631-01-01 (Low LH Aft Beam)	<i>Olasa Kehu</i> M795441 Dec 1/14				
100632, Rev. 0B 100632-01-02 (High RH Fwd Beam)	<i>Olasa Kehu</i> M795441 Dec 1/14				
100633, Rev. 0B 100633-01-02 (High RH Aft Beam)	<i>Olasa Kehu</i> M795441 Dec 1/14				
100635, Rev. 0B 100635-01, -02, -03 (Struts, drag link)	<i>Olasa Kehu</i> M795441 Dec 1/14				

CONFORMITY INSPECTION RECORD – Flight Test Articles

APPLICANT'S ATTESTATION

I hereby confirm that the prototype installation for the subject

☒ MODIFICATION,

☐ REPAIR,

☐ TSO/AP-TC ARTICLE

is in conformity with the applicable installation drawing(s) listed above
and that necessary ground tests have been carried out.

[Please check (✓) the applicable box.]

Additional Information:

Mounting beams and struts are not painted or powder coated as specified – does not affect flight test.

Signature: _____

Aasa Behn 11795441

TC INSPECTION

☐ ACCEPTABLE

☐ UNACCEPTABLE

Remarks:

Signature: _____

CONFORMITY INSPECTION RECORD – Flight Test Installation

Applicant Aero Design Ltd.	Aeronautical Product				Title of Change
	Make	Model	Serial No.	Registration	Cargo Basket Installation (1006 Configuration)
	Bell	212	30702	C-GWWL	
Drawing No.	Applicant's Inspector		T.C. Inspection		Findings
	Signature	Date	Signature	Date	
100602, Rev. 0A 100602-01-01 (Basket Installation Extended Lid, LH Low Mounted)	Aasa Rehm M795441	Dec 1/14			
100602, Rev. 0A 100602-02-02 (Basket Installation Extended Lid, RH High Mounted)	Aasa Rehm M795441	Dec 1/14			
100605, Rev. 0PD1 100605-01-01 (Provisions Install'n, LH Low Mounted)	Aasa Rehm M795441	Dec 1/14			
100606, Rev. 0PD1 100606-01-02 (Provisions Install'n, RH High Mounted)	Aasa Rehm M795441	Dec 1/14			

CONFORMITY INSPECTION RECORD – Flight Test Installation

APPLICANT'S ATTESTATION

I hereby confirm that the prototype installation for the subject

- ☒ MODIFICATION,
☐ REPAIR,
☐ TSO/AP-TC ARTICLE

is in conformity with the applicable installation drawing(s) listed above
and that necessary ground tests have been carried out.
[Please check (✓) the applicable box.]

Additional Information:

Drawings 100605 Rev. 0 PD1 and 1006 Rev. 0 PD1 are prototype disposition drawings showing the deviations from drawings 100605 Rev. 0 Chg. B and 100606 Rev. 0 Chg. B, as installed on the helicopter in advance of flight testing. The deviations are the use of different lengths of bolts than specified, and the corresponding number and/or thickness of washers required to set the nuts used on the bolts in safety.

Signature: _____

Jose Rehm MT95241

TC INSPECTION

- ☐ ACCEPTABLE
☐ UNACCEPTABLE

Remarks:

Signature: _____

CONFORMITY INSPECTION RECORD – Flight Test Articles

Applicant Aero Design Ltd.	Aeronautical Product				Title of Change Cargo Basket Installation (1006 Configuration)
	Make	Model	Serial No.	Registration	
	Bell	212			
Drawing No.	Applicant's Inspector		T.C. Inspection		Findings
	Signature	Date	Signature	Date	
100610-02 (Basket, Extended Lid) S/N 100602-01	JH Chh.	12 Nov 2014			
100630-01-01 (Low LH Fwd Beam)	JH Chh.	12 Nov 2014			
100631-01-01 (Low LH Aft Beam)	JH Chh.	12 Nov 2014			
100632-01-02 (High RH Fwd Beam)	JH Chh.	12 Nov 2014			
100633-01-02 (High RH Aft Beam)	JH Chh.	12 Nov 2014			
100635-01, -02, -03 (Struts, drag link)	JH Chh.	12 Nov 2014			

APPLICANT'S ATTESTATION

I hereby confirm that the prototype installation for the subject

☒ MODIFICATION,

☐ REPAIR,

☐ TSO/AP-TC ARTICLE

is in conformity with the applicable installation drawing(s) listed above
and that necessary ground tests have been carried out.

[Please check (✓) the applicable box.]

TC INSPECTION

☐ ACCEPTABLE

☐ UNACCEPTABLE

Additional Information:

Mounting beams and struts are not painted/powder coated as specified – does not affect flight test.

Signature: _____

Jff Ckh.

Remarks:

Signature: _____

CONFORMITY INSPECTION RECORD – Load Test Articles

Applicant Aero Design Ltd.	Aeronautical Product				Title of Change Cargo Basket Installation (1006 Configuration)
	Make	Model	Serial No.	Registration	
	Bell	212			
Drawing No.	Applicant's Inspector Signature Date		T.C. Inspection Signature Date		Findings
100610-02 (Basket, Extended Lid)	JH Calk. 11 Nov 2014				
100630-01-01 (Low LH Fwd Beam)	JH Calk. 11 Nov 2014				
100631-01-01 (Low LH Aft Beam)	JH Calk. 11 Nov 2014				
100635-01, -02, -03 (Struts, drag link)	JH Calk. 11 Nov 2014				

APPLICANT'S ATTESTATION

I hereby confirm that the prototype installation for the subject

☒ MODIFICATION,

☐ REPAIR,

☐ TSO/AP-TC ARTICLE

is in conformity with the applicable installation drawing(s) listed above
and that necessary ground tests have been carried out.
[Please check (✓) the applicable box.]

Additional Information:

Checker plate walkway not installed on basket lid – does not affect structural test.
No components are painted/powder coated as specified – does not affect structural test.

Signature: JH Calk.

TC INSPECTION

☐ ACCEPTABLE

☐ UNACCEPTABLE

Remarks:

Signature: _____

TEST PLAN AND REPORT

TR1006.02

BELL 205, 212, 214, 412

EXTRA LARGE CARGO BASKET INSTALLATION

BASKET LOAD TESTS

Prepared by: Jeff Clarke, P.Tech.(Eng.)

Revision 0, 14 September 2014

Aero Design Ltd.



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Phone: 604-483-2376

Fax: 604-483-2372

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1.0 INTRODUCTION

This report documents the load tests used to demonstrate compliance with the structural requirements of the basis of certification.

2.0 REFERENCE TEXT

Aero Design Ltd. Engineering Report ER1006.01, Revision 0

Engineering Report ER1006.01, Revision 0, 14 September 2014, Quick Release Mega Cargo Basket – Compliance report

-Loads, section 4.0

Aero Design Ltd. Installation Drawings:

100602, Revision 0 – Cargo Basket Installation – Extended Lid

100605, Revision 0 – Mounting Provisions Installation (Low Mount)

Aero Design Ltd. Fabrication Drawings:

100610, Revision 0 – Cargo Basket Assembly

100611, Revision 0 – Basket Body Assembly

100613, Revision 0 – Extended Lid Assembly

100630, Revision 0 – Forward Mounting Beam Fabrication (Low Mount)

100631, Revision 0 – Aft Mounting Beam Fabrication (Low Mount)

100635, Revision 0 - Struts

3.0 LOADS

The loads are determined in Engineering Report ER1006.01, Revision 0. The summarized loads are below.

3.1 Combined Positive Maneuvering and Drag Load

$P_{lim_man} = 1838 \text{ lbs} - 109 \text{ lbs}$ (basket applies 1g down - 109 lbs)

$P_{lim_man} = 1729 \text{ lbs}$ Limit positive maneuvering load due to basket and cargo

$P_{lim_drag} = 512 \text{ lbs}$ Limit drag load

$P_{ult_man} = 2756 \text{ lbs} - 109 \text{ lbs}$ (basket applies 1g down - 109 lbs)

$P_{ult_man} = 2647 \text{ lbs}$ Ult. positive maneuvering load due to basket and cargo

$P_{ult_drag} = 768 \text{ lbs}$ Ultimate drag load

3.2 Negative Maneuvering Load

$P_{lim_cargo_neg} = -400 \text{ lbs}$ Limit negative maneuvering load due to cargo

$P_{ult_cargo_neg} = -600 \text{ lbs}$ Ultimate negative maneuvering load due to cargo

3.3 Sideward Emergency Landing Load

$P_{ult_side} = 20 \text{ lbs}$ Ultimate sideward load on handle assembly

4.0 TEST SETUP

4.1 Test Article

The tests will be performed using the following:

100610-02 - Cargo Basket Assembly with Extended Lid

100630-01-01 - LH Low Forward Beam Assembly

100631-01-01 - LH Low Aft Beam Assembly

100635-01, 100635-02, 100635-03 - Forward and Aft Strut Assembly and Drag Link

Form AN B043 conformity inspection record will be completed by Aero Design Ltd. The basket will be available for inspection by Transport Canada.

4.2 Test Fixture

The tests are performed on a fixture that simulates the hardpoints on the left side of the helicopter. The fixture consists of a large I beam with lugs located in the same position as on the helicopter.

The cargo basket mounting provisions are installed on the fixture in accordance with drawing 100605. The cargo basket is installed on the mounting provisions in accordance with drawing 100601.

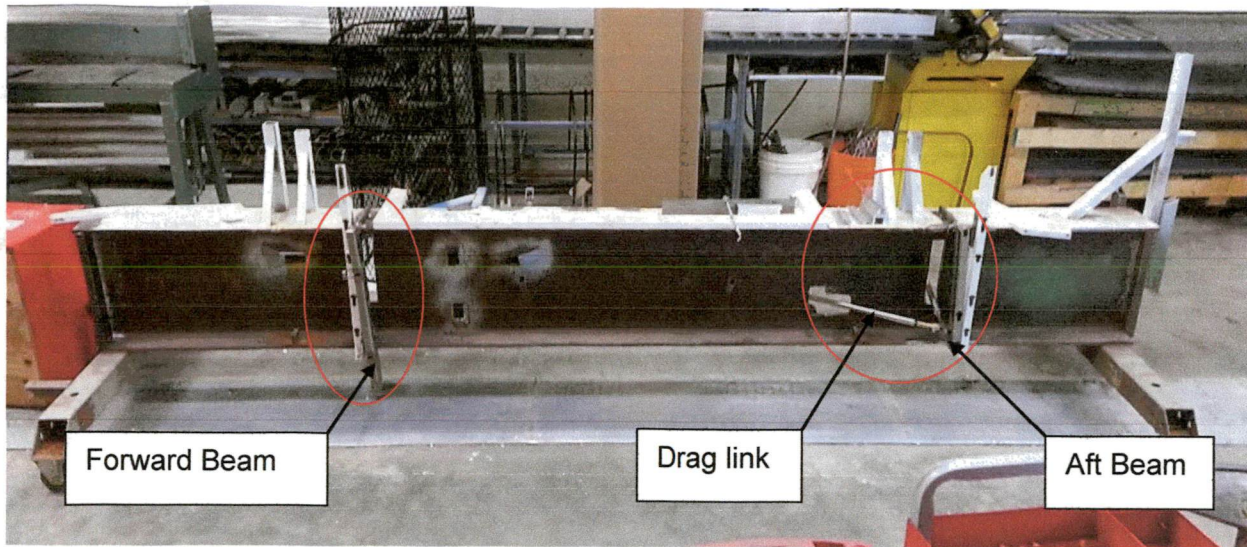


Figure 4.1.1 – Test Fixture – Side view

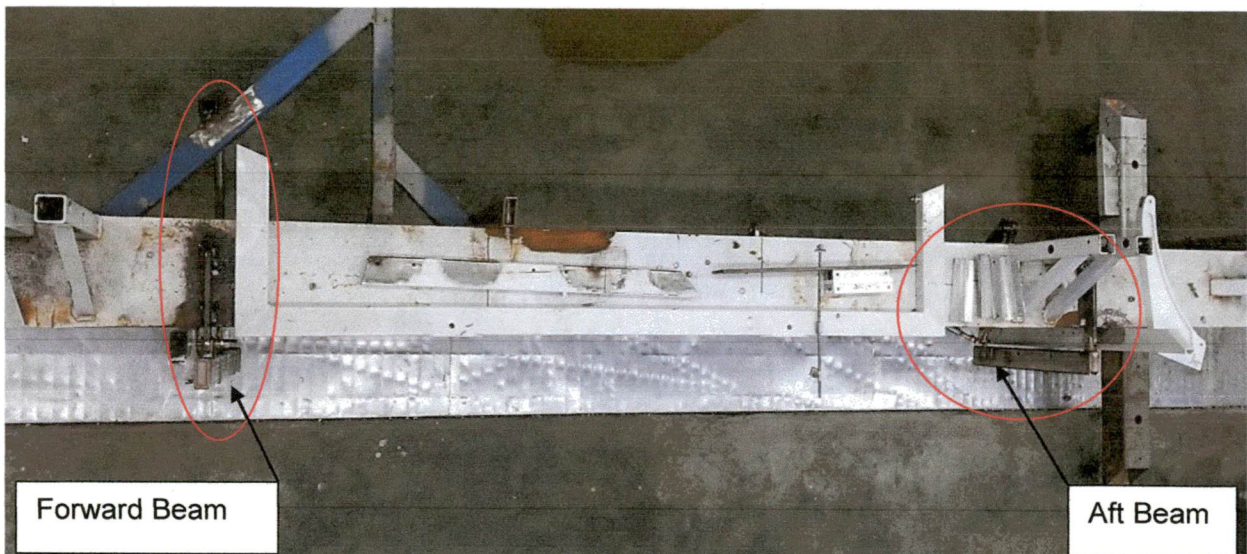


Figure 4.1.2 – Test Fixture – Top View

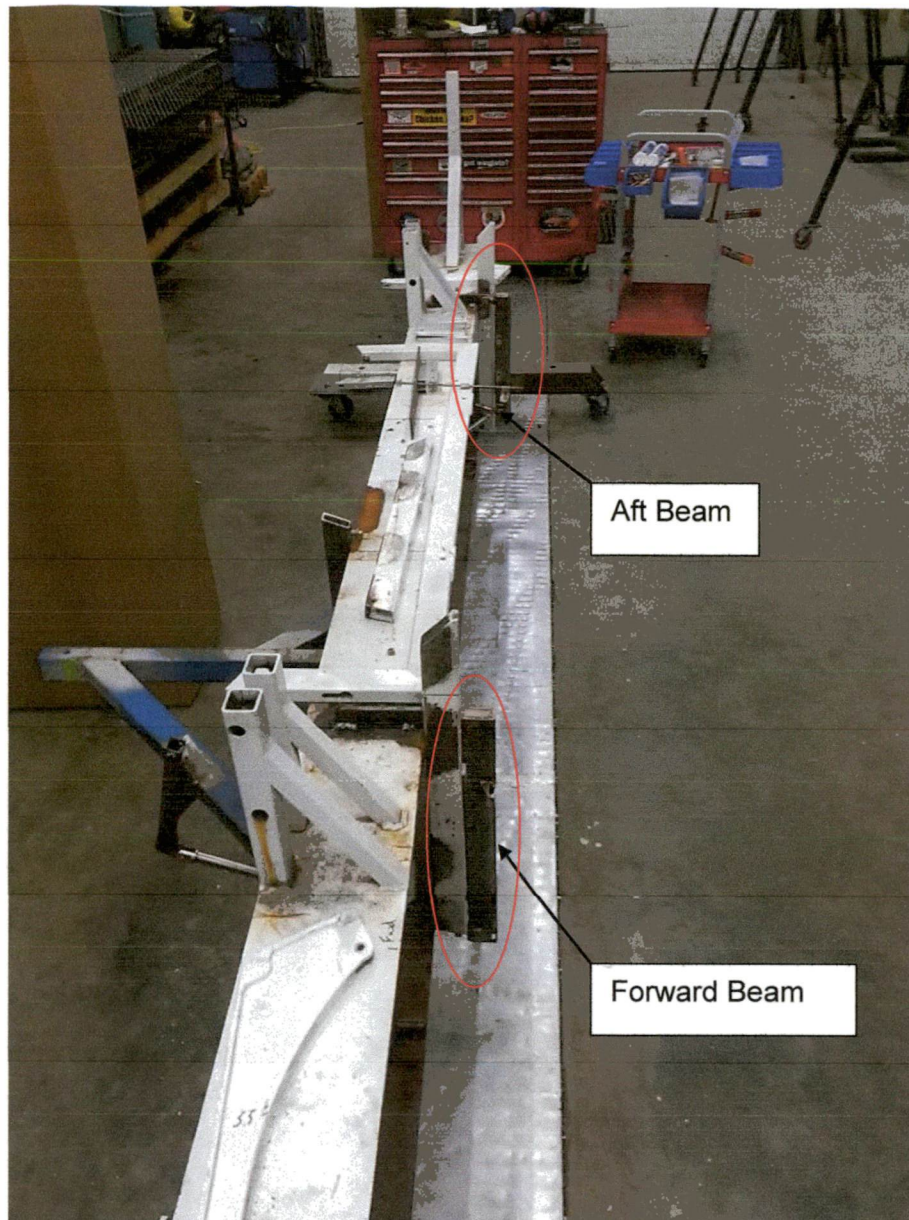


Figure 4.1.3 – Test Fixture – End View

To simulate drag, a plywood sheet is cut to fit the shape of the end of the basket with an eyebolt in the centre to pull on the sheet. A 2x4 or similar support may be required to evenly distribute the load over the sheet.

4.3 Procedure

4.3.1 Combined Positive Maneuvering and Drag Load

1. Install the basket on the mounting beams. Open the lid. Insert plywood sheet at aft end (see fixture description). 1741
2. Apply the limit maneuvering load (1729 lbs) downward using bags of lead shot, 25 lbs each, evenly distributed over the bottom of the basket. 70 bags are required (1750 lbs).
3. Close the lid and latch the handle. Ensure correct functioning of handle latching.
4. Pull limit drag load (512 lbs) aft on eye bolt from step 2 using a load cell and chain come-along.
5. The load must be applied for at least 3 seconds.
6. Document the test with pictures of the bags of lead shot stacked in the basket and of the overall test.
7. CAREFULLY release the drag load.
8. CAREFULLY open the lid. Keep feet clear of basket. Remove the load from the basket. Remove the basket from the mounting beams.
9. Visually inspect the basket, lid, hinge, handle and brackets, and mounting beams for signs of permanent deformation. Ensure correct functioning of handle latching.
10. Install the basket on the mounting beams. Open the lid. Insert plywood sheet at aft end.
11. Apply the ultimate load (2647 lbs) downward using bags of lead shot, 25 lbs each, evenly distributed over the surface of the lid. 106 bags are required (2650 lbs), or additional confirmed weights totaling at least 2647 lbs. 2659
CAUTION: KEEP FEET CLEAR FROM UNDER BASKET.
12. Close the lid and latch the handle.
13. Pull ultimate drag load (768 lbs) aft on eye bolt using a load cell and chain come-along.
14. The load must be applied for at least 3 seconds.
15. Document the test with pictures of the bags of lead shot stacked on the lid and of the overall test.
16. CAREFULLY release the drag load.
17. CAREFULLY open the lid. Keep feet clear of basket. Remove the load from the basket. Remove the basket from the mounting beams.
18. Visually inspect the basket, lid, hinge, handle and brackets, and mounting beams for signs of permanent deformation or failure. Ensure correct functioning of handle latching.
19. Record the results in section 5.1 below.

4.3.2 Negative Maneuvering Load

1. Install the basket upside down on the mounting beams. Open the lid, supporting the lower edge to prevent pulling on the prop.
2. Apply the limit load (400 lbs) downward using bags of lead shot, 25 lbs each, evenly distributed over the surface of the lid. 16 bags are required (400 lbs).
3. Close the basket and latch the handle.
4. The load must be applied for at least 3 seconds.

0 lb

to 0B ● ge straight ↓ ← 1/8" e center

End 21 3/8

End Attach 29 5/8

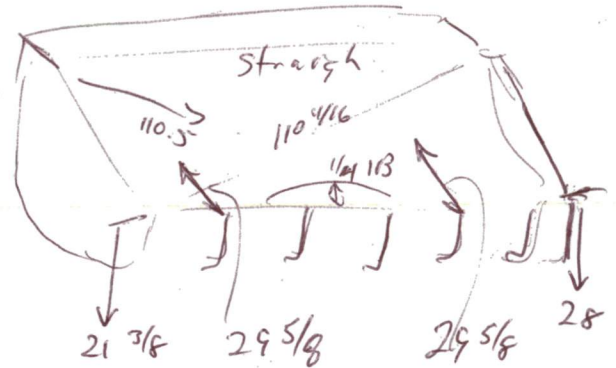
Aft Attach 29 5/8

Aft 28

MID 29 9/16

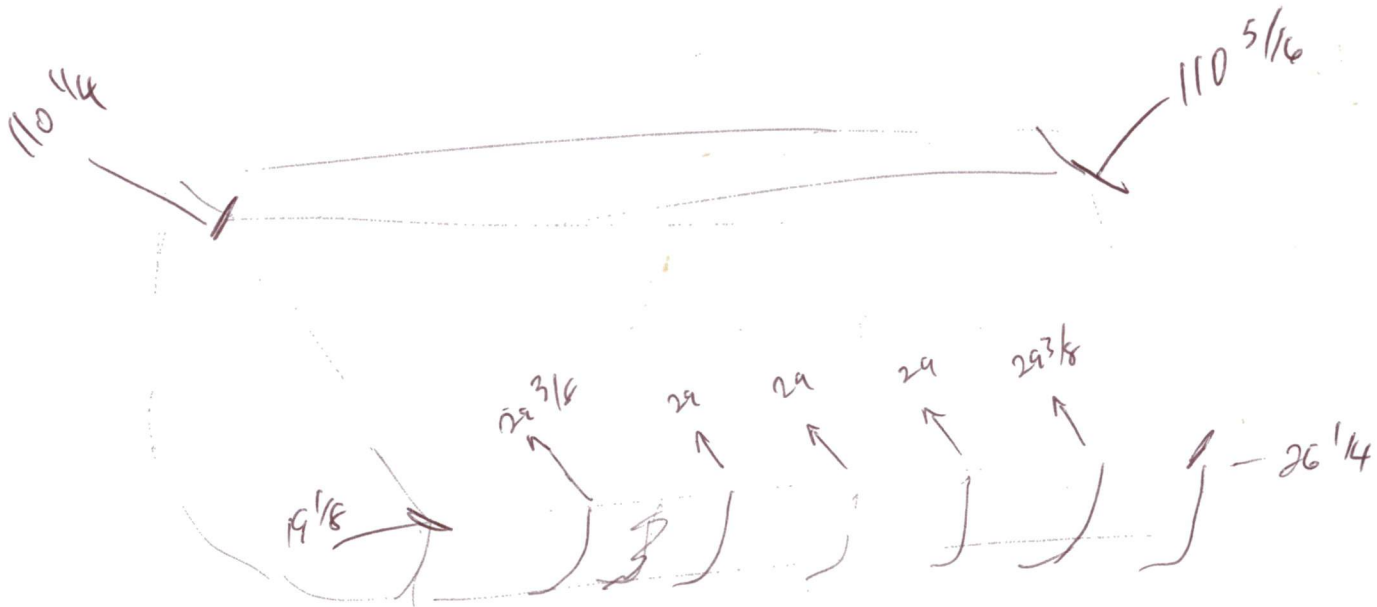
Diagonals 110 1/16 / 110 1/2

IB edge straight



Limit 1750 lb / 512 drag

handle works ✓

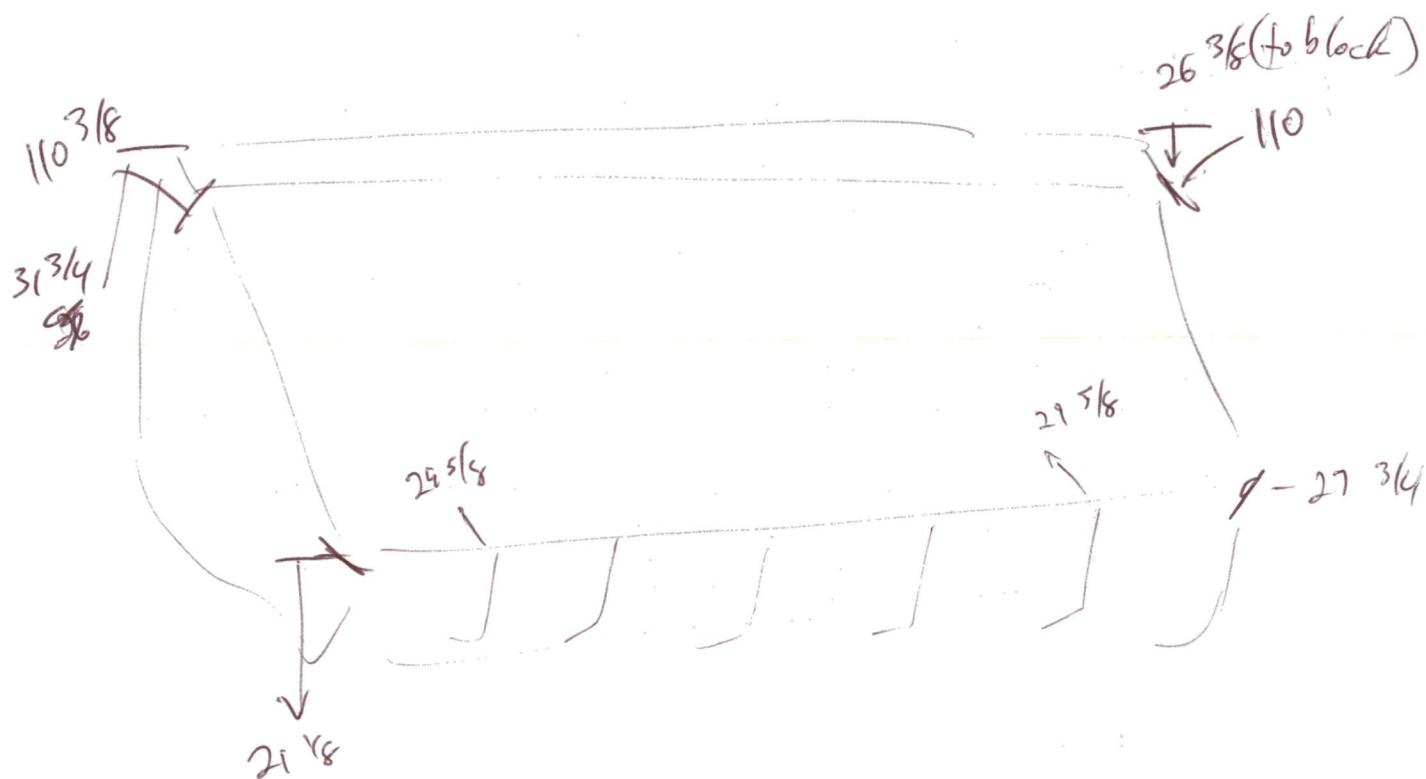


5. Document the test with pictures of the bags of lead shot stacked in the lid and of the overall test.
6. CAREFULLY open the lid, ensuring it is supported so it does not drop. Remove the load from the basket lid.
7. Visually inspect the lid, hinge, handle and brackets for permanent deformation. Ensure correct functioning of handle latching.
8. Apply the ultimate load (600 lbs) downward using bags of lead shot, 25 lbs each, evenly distributed over the surface of the lid. 24 bags are required (600 lbs).
9. Close the basket and latch the handle.
10. The load must be applied for at least 3 seconds.
11. Document the test with pictures of the bags of lead shot stacked in the lid and of the overall test.
12. CAREFULLY open the lid, ensuring it is supported so it does not drop. Remove the load from the basket lid. Remove the basket from the mounting beams.
13. Visually inspect the lid, hinge, handle and brackets for signs of permanent deformation. Ensure correct functioning of handle latching.
14. Record the results in section 5.2 below.

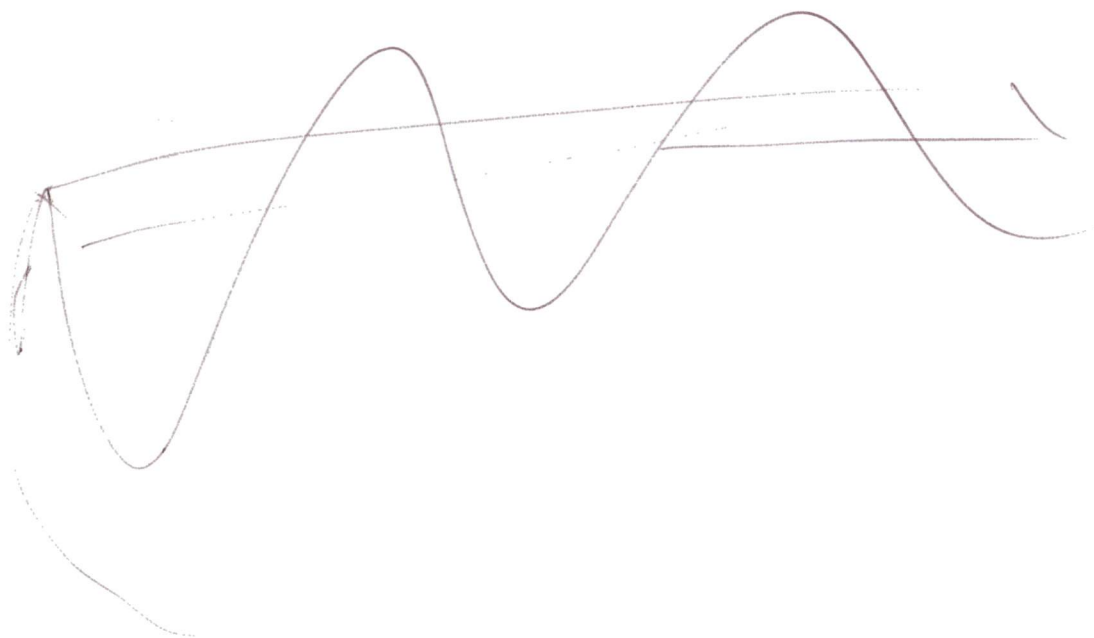
4.3.3 Sideward Emergency Landing Load Condition

1. Attach a second identical handle assembly to the handle installed on basket. Do not latch handle in brackets.
2. Set basket with handle down on blocks to allow the handle to hang.
3. Check that handle springs hold handle up to brackets. Handle must be able to engage secondary catch on handle brackets.
4. Latch handle in brackets
5. Attempt to open handle to ensure there is sufficient friction to hold the handle closed. Record load required to open handle in section 5.3 below

0 after Lim



0 after cutting bar back.



5.0 TEST RESULTS

Tests witnessed by TCCA DAR 304 James Tinson on 11 November 2014.

5.1 Positive Maneuvering Load

The positive maneuvering load tests were performed on basket assembly 100610-02.

5.1.1 Limit Load

Condition	Required Load	Actual Load	Witness Initial
Limit Maneuvering Load (downward)	1729 lbs (distributed over bottom)		
Limit Drag (aft)	512 lbs (distributed over end)		

Figure 5.1.1 –

Figure 5.1.2 –

5.1.2 Ultimate Load

Condition	Required Load	Actual Load	Witness Initial
Ultimate Maneuvering Load (downward)	2647 lbs (distributed over bottom)		
Ultimate Drag (aft)	768 lbs (distributed over end)		

Figure 5.1.3 –

Figure 5.1.4 –

5.2 Negative Maneuvering Load

5.2.1 Limit Load

Condition	Required Load	Actual Load	Witness Initial
Limit Maneuvering Load (upward)	400 lbs (distributed)		

Figure 5.2.1 – Limit Negative Maneuvering Load

5.2.2 Ultimate Load

Condition	Required Load	Actual Load	Witness Initial
Ultimate Maneuvering Load (upward)	600 lbs (distributed)		

Figure 5.2.1 – Ultimate Negative Maneuvering Load

5.3 Emergency Landing Side Load

5.3.1 Ultimate Load

Condition	Required Load	Actual Load	Witness Initial
Ultimate Load (side)	2g (~10 lbs)		

Figure 5.3.1 –

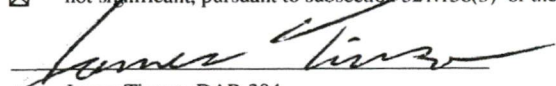
5.4 Findings / Comments



DESIGN CHANGE APPROVAL APPLICATION

DEMANDE D'APPROBATION D'UNE MODIFICATION DE LA CONCEPTION

Legal name and address of applicant Nom et adresse légal du demandeur Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3		Legal name and address of prospective holder Nom et adresse légal du titulaire éventuel Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3		Name and address for billing purposes (if different than applicant) Nom et adresse aux fins de facturation (si différent du demandeur)	
Identification of aeronautical product / Identification du produit aéronautique					
Make / Marque Bell		Model / Modèle 205/212/214/412		Registration / Immatriculation All eligible	
				Serial No. / N° du série All eligible	
				Part No. / N° de la pièce	
Request for (check appropriate box) / Objet de la demande (Cochez les carrés selon le cas)				Type Design Examination by Foreign Authority Examen de la définition de type par autorité étrangère	
<input type="checkbox"/> STC CTS <input type="checkbox"/> STC (single serial number) CTS (numéro de série simple) <input type="checkbox"/> STC (multiple serial numbers) CTS (numéros de série multiples) <input type="checkbox"/> Type Certificate Revision Revision de certificat de type <input checked="" type="checkbox"/> Revision Révision				<input type="checkbox"/> Repair Design Approval (RDA) Approbation de la conception de réparation (ACR) <input type="checkbox"/> Repair Design Approval - Process Repair ACR - Processus de réparation <input type="checkbox"/> Part Design Approval (PDA) Approbation de la conception de pièce (ACP)	
No. SH07-56 N°				Current Issue 2 Édition active	
<input type="checkbox"/> Restricted Category Catégorie restreinte					
Type of Operation Type d'opération					
Title and brief description of modification, repair or replacement part, including effects of changes (use additional pages if necessary). Refer to CAR 521.155(b)(i) for details. Titre et brève description de la modification, de la réparation ou de la pièce de rechange, y compris les effets des changements (utiliser des feuilles supplémentaires si nécessaire). Référez-vous à RAC 521.155(b)(i) pour des détails. External Cargo Basket and Cabin Steps Installation Installation of mounting provisions on the fuselage; installation of quick release cargo basket on mounting provisions; installation of cabin step on mounting provisions					
Applicable Type Certificate (TC) / Certificat de type (CT) pertinent					
TC No. / N° de CT H1SW, H-80, H-86, H-104		Issue No. / N° de l'édition 24, 3, 12, 3		Identify State of Design / Identifier l'état de conception FAA	
The applicant is responsible for the control of product manufacture / Le demandeur est responsable du contrôle de la fabrication du produit					
<input checked="" type="checkbox"/> Yes Oui					
<input type="checkbox"/> No Non					
If no, identify who is responsible Si non, identifier qui est responsable					
Documentation to be submitted Documentation à soumettre				Applicant Demandeur	
				Submitted Soumis	
				Yes Oui	
				No Non	
Proposed certification basis Proposition de base de certification				<input checked="" type="checkbox"/>	
Certification plan in accordance with CAR 521.155(d) Plan de certification selon RAC 521.155(d)				<input checked="" type="checkbox"/>	
Applicant's remarks / Remarques du demandeur Revision is to update holder, add 2 new configurations, and add 205B and 214B and 214B-1 models.					
I hereby certify that the information contained herein is correct and complete. I agree to pay charges as prescribed in Part 1, Subpart 4 of the CARs (CAR 104-Charges). Je certifie que les renseignements figurant ci-dessus sont exacts et complets. Je m'engage à payer les redevances prescrites à la sous-partie 4 de la partie I du RAC (sous-partie 104 du RAC - Redevances).					
Name and Signature of Applicant / Nom et signature du demandeur JEFF CLARKE		Title / Poste VICE PRESIDENT		Date (yyyy-mm-dd) / Date (aaaa-mm-jj) 2014/09/29	

CHANGED PRODUCT RULE (CPR) DECISION RECORD		
NAPA No.:		
Step 1: Identify the proposed change to the aeronautical product. (Section 4.1 of AC 500-016)	The changes are detailed in the listed document(s): Certification Plan CP1006, Revision 0.	
Note: A G-1 Issue Paper <u>may</u> be required to track/document the decisions at Step 2 and Steps 5 through 8, and to detail the concluded certification basis.		
Step 2: Is the change substantial? (Section 4.2 of AC 500-016)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	A new type certificate is required. CPR Decision Process is Closed . Proceed to Step 3
Step 3: Will the latest standards be used? (Section 4.3 of AC 500-016)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Certification basis to use latest standards. Proceed to Step 8. Proceed to Step 4.
Step 4: Group changes into related and unrelated groupings. (Section 4.4 of AC 500-016)	You may need to define the project in the format of the AC's example for Step 4. Note: For multiple groupings, continuation of this process should be split to separate decision records.	
Step 5: Is the proposed change significant? (Section 5.0 of AC 500-016)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Proceed to Decision . Compliance may be shown to earlier standards. Certification basis to be defined and documented as indicated (below). Proceed to Step 8.
Decision: Will the latest standards be used?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Certification basis to use latest standards. Proceed to Step 8. Proceed to Step 6, addressing each area separately (see below).
Identification of Affected Areas:	The area(s) affected by the proposed change have been detailed in Certification Plan document number(s): CP1006, Revision 0	
Step 6: Is this area affected by the proposed change? (Ask for each area) (Section 6.1 of AC 500-016)	<input type="checkbox"/> Yes <input type="checkbox"/> No	Proceed to Step 7. Compliance with the latest standards is not required. Compliance may be continued to be shown with the existing certification basis.
Step 7: Do the latest standards contribute materially to the level of safety and are they practical? (Section 6.2 of AC 500-016)	<input type="checkbox"/> Yes <input type="checkbox"/> No	Certification basis to be established using latest standards. Compliance with the latest standards is not required. Compliance may be shown to earlier standards. Certification Basis defined or documented as indicated in below. Note: Several standards may apply to each area and the assessment may differ from standard to standard. Indicate Yes if compliance with any latest standard(s) will be required. Indicate No only if earlier standards are to be applied.
<input type="checkbox"/> Continuation Sheet(s) Attached		
Note: A delegate may develop a proposal for the Yes/No decision of Step 7. TCCA will make the final determination.		
Step 8: Is the proposed Basis of Certification Adequate? (Section 8.0 of AC 500-016)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Stop! CPR Decision Process is Closed. Determination of Certification Basis is Complete! Basis of certification may require later airworthiness standards or Special Conditions – Consult TCCA.
Certification Basis	The certification basis is as follows or as detailed in the listed document(s): Bell 412CF, TCDS H-86, Issue 12 (highest of all models requests): FAR Part 29 dated 1 February 1965, Amendments 29-1 and 29-2, and select sections up to Amend 29-32, refer to TCDS.	
Under the delegated authority, I have examined the change in type design listed above according to established procedures and hereby determine, to the best of my knowledge and belief, that it is. (check one)		
<input type="checkbox"/> substantial, pursuant to section 521.153 of the CARs <input type="checkbox"/> significant, pursuant to subsection 521.158(3) of the CARs <input checked="" type="checkbox"/> not significant, pursuant to subsection 521.158(3) of the CARs		
 James Tinson, DAR 304		SEP 26 2014 Date

COVER PAGE FOR EPM 001

ENGINEERING PROCEDURES MANUAL

Specialties: General, Powerplants and Structures

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DAR No. 304

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APPENDIX B: Functional Matrixes – General, Powerplants and Structures

This matrix defines the delegated functions and authorized areas for the specialties noted. Appendix C further defines the level of delegation provided through reference to the delegated AWM paragraphs.

Chart 1, Powerplants

Authorized Areas Note: Delegated functions and authorized areas are shown by an "X". Delegated functions and authorized areas as limited per "General" are shown by an "G".	Turbine Engine Install	Piston Engine Install	Powerplant-General	Powerplant-Rotorcraft	Engine	Propeller	Special			
Delegated Functions										
1. Engine Installations	X	X	X	X						
2. Fuel and Oil System	X	X	X	X						
3. Induction System and Cowling	X	X	X	X						
4. Exhaust and Thrust Reverser	X	X	X	X						
5. Powerplant Fire Protection	X	X	X	X						
6. Powerplant Ice Protection										
7. Powerplant Cooling			X							
8. Performance										
9. Vibration Analysis										
10. Propeller Installation										
11. Approved Service Documents	X	X	X	X	X	X				
12. Lightning Protection			X							
13. Drive System Installation										
14. Manuals	X	X	X	X	X	X				
15. Reliability Analysis			X							
16. Drive System Analytical System			X							
17. Transmission (Repair Only)			X							
18. Noise Testing										
19. Exhaust Emissions										
20. Detail Design (Repair Only)			X							

Chart 2, Structures

Authorized Areas Note: Delegated functions and authorized areas are shown by an "X". Delegated functions and authorized areas as limited per "General" are shown by an "G".	Structural – Wing Group	Structural – Fuselage Group	Structural – Empennage Group	Structural – Landing Gear	Structural – Flight Controls	Structural – Rotor	Loading Control Documents	Metallic Materials (2)	Nonmetallic Materials (3)	Interior Arrangements	Interior Materials	Fire Protection	Evacuation Systems	Door Systems
	DELEGATED FUNCTIONS													
STATIC ANALYSIS		X	X	X		X				X				X
DYNAMIC ANALYSIS														
FATIGUE ANALYSIS														
DESIGN AND CONSTRUCTION		X	X	X		X				X	X	X		
FLUTTER/GROUND VIBRATION														
SAFETY ANALYSIS														
FLOTATION & DITCHING ANALYSIS														
STRUCTURAL LOADING LIMITATIONS														
SERVICE DOCUMENTS		X	X	X		X				X	X	X		
MATERIAL & PROCESS SPEC.		X	X	X				X	X					
FLAMMABILITY											X	X		
DAMAGE TOLERANCE EVALUATIONS														

NOTE (1): Embraces all airframe components such as wing, fuselage, empennage, landing gear, flight controls, engine mounts, and special components, but does not apply to rotors.

NOTES (2) and (3): Select Specialty by Note number and sub-letter. General applies to all processes listed.

(2) Metallic Materials/Processes

A - Materials & Processes – General
B - Non-Destructive Inspection/Testing
C - Metallurgy
D - Metal Joining Processes
E - Structural Adhesives
F - Mechanical Fasteners
G - Surface Treatment/Coatings
H - Bearings

(3) Nonmetallic Materials/Processes

A - Material & Processes - General
B - Transparent (Glazed) Material
C - Polymeric Materials
D - Structural Adhesives
E - Mechanical Fasteners
F - Composites
G - Non-Destructive Inspection/Testing
H - Surface Treatment & Coatings
I - Structural Joining Methods

APPENDIX C: Specialty Delegation Matrixes - AWM Parts 523, 525, 527, 529, 533 & 551

The following tables describe the granted delegated responsibilities for DAR 304 as applicable to the specialties of Structures and Powerplants.

Delegated responsibility for the predecessor regulations and the equivalent FAA/EASA regulations is implied.

An explanation of the matrix provided on the following pages is:

Column 1	Identifies the applicable AWM Chapter (in this case 525);
Column 2	Identifies the applicable AWM requirement (in this case 1);
Column 3	Identifies the AWM requirement paragraph title (in this case Subpart A - General. Applicability); and
Column 4	Identifies if there is an exception to this (this may indicate that the requirement is Not Delegated). If this block is empty, then the requirement is delegated.

Column 1	Column 2	Column 3	Column 4
CHAPTER	REQUIREMENT	PARAGRAPH TITLE	EXCEPTIONS
525	1	Subpart A - General. Applicability.	

The delegation matrixes for AWM 523, 525, 527, 529, 533 and 551 are as shown in the following tables:

AWM 523, Normal, Utility, Aerobatic and Commuter Category Aeroplanes			
CHAPTER	REQUIREMENT	PARAGRAPH TITLE	EXCEPTIONS
		SUBCHAPTER A – General	
523	1	Applicability.	
523	2	Special Retroactive Requirements	
		SUBCHAPTER B - Flight	
523	29	Empty weight and corresponding center of gravity.	
		SUBCHAPTER C - Structure - General	
523	303	Factor of safety.	
523	305 (a) (b)	Strength and deformation.	
523	307 (a)	Proof of Structure	
		Flight Loads	
523	337 (a) (b) (c)	Limit manoeuvring load factor	
		Control Surface and System Loads	
523	397 (a) (c)	Limit Control Forces and Torques	
		Emergency Landing Conditions	
523	561	General	
		SUBCHAPTER D – Design and Construction - General	
523	601	General.	
523	603	Materials and workmanship	
523	605 (a)	Fabrication methods.	
523	607	Fasteners.	
523	609	Protection of structure.	
523	611	Accessibility provisions.	
523	613	Material strength properties and design values.	
523	619	Special factors.	
523	621	Casting factors.	
523	623	Bearing factors.	
523	625	Fitting factors.	
523	627	Fatigue strength	
		Personnel and Cargo Accommodations	
523	771 (a) (b)	Pilot Compartment	
523	787	Baggage and Cargo compartments.	

AWM 523, Normal, Utility, Aerobatic and Commuter Category Aeroplanes

CHAPTER	REQUIREMENT	PARAGRAPH TITLE	EXCEPTIONS
		Fire Protection	
523	851	Fire extinguishers	
523	853 (a) (b) (c) (e)	Passenger and crew compartment interiors	
		SUBCHAPTER F - Equipment - General	
523	1301	Function and installation.	Limited to: Unpressurized aircraft Non-required equip. Non-complex avionics Non-integrated avionics
523	1307	Miscellaneous equipment	
523	1309	Equipment, systems & installations	
523	1321	Arrangement and visibility	
523	1322	Warning, caution & advisory lights	
		Electrical Systems and Equipment	
523	1351	General	
523	1357	Circuit protection devices	
523	1361	Master switch arrangement	
523	1365	Electrical cables and equipment	
523	1367	Switches	
		Lights	
523	1381	Instrument lights	
		Safety Equipment	
527	1411	General	
527	1413	Safety belts	
		SUBCHAPTER G - Operating Limitations and Information	
523	1529	Instructions for continued airworthiness	
		Markings and Placards	
	1557	Miscellaneous markings and placards	
		Aeroplane Flight Manual and Approved Manual Material	
523	1589 (a)	Loading information	
End of AWM 523			

AWM 525, Transport Category Aeroplanes

CHAPTER	REQUIREMENT	PARAGRAPH TITLE	EXCEPTIONS
		SUBCHAPTER A - General	
525	1	Applicability.	
525	2	Special Retroactive Requirements	
		SUBCHAPTER B - Flight - General	
525	29	Empty weight and corresponding center of gravity.	
		SUBCHAPTER C - Structure - General	
525	303	Factor of safety.	
525	305 (a)(b)	Strength and deformation.	
525	307 (a)	Proof of Structure	
		Flight Manoeuvre And Gust Conditions	
525	337 (a) (b) (c)	Limit manoeuvring load factors	
		Emergency Landing Conditions	
525	561	General.	
		SUBCHAPTER D - Design and Construction	
525	601	Design	
525	603 (a) (b)	Materials.	
525	605 (a)	Fabrication methods.	
525	607	Fasteners.	
525	609	Protection of structure.	
525	611 (a)	Accessibility provisions.	
525	613	Material strength properties and design values.	
525	619	Special factors.	
525	621	Casting factors.	
525	623	Bearing factors.	

525	625	Fitting factors.	
		Personnel And Cargo Accommodations	
525	785	Seats, berths, safety belts, and harnesses.	
		SUBCHAPTER G – Operating Limitations and Information	
525	1529	Instructions for continued airworthiness	
		Markings and Placards	
525	1557	Miscellaneous markings and placards	
End of AWM 525			

AWM 527, Normal Category Rotorcraft			
CHAPTER	REQUIREMENT	PARAGRAPH TITLE	EXCEPTIONS
		SUBCHAPTER A - GENERAL	
527	1	Applicability.	
527	2	Special Retroactive Requirements	
		SUBCHAPTER B – FLIGHT – GENERAL	
527	29	Empty weight and corresponding center of gravity.	
		SUBCHAPTER C - STRENGTH REQUIREMENTS - GENERAL	
527	303	Factor of safety.	
527	305(a)(b)(1)	Strength and deformation.	
527	307(a)(b)(2)	Proof of structure	
		Flight Loads	
527	337 (a)	Limit manoeuvring load factor	
		Control Surface and System Loads	
527	397	Limit pilot forces and torques.	
		Emergency Landing Conditions	
527	561	General	
		SUBCHAPTER D - DESIGN AND CONSTRUCTION - GENERAL	
527	601	Design	
527	603	Materials.	
527	605 (a)	Fabrication methods.	
527	607	Fasteners.	
527	609	Protection of structure.	
527	611	Inspection provisions.	
527	613	Material strength properties and design values.	
527	619	Special factors.	
527	621	Casting factors.	
527	623	Bearing factors.	
527	625	Fitting factors.	
		Personnel and Cargo Accommodations	
527	771 (a) (b)	Pilot Compartment	
527	773	Pilot Compartment view	
527	785 (a) to (h)	Seats, berths, litters, safety belts, and harnesses.	
527	787	Cargo and baggage compartments.	
527	807	Emergency exits	
527	831 (a)	Ventilation	
		Fire Protection	
527	853	Compartment interiors.	
527	855 (a)	Cargo and baggage compartments.	
		External Loads	
527	865 (a) – (e)	External loads	

AWM 527, Normal Category Rotorcraft			
CHAPTER	REQUIREMENT	PARAGRAPH TITLE	EXCEPTIONS
		SUBCHAPTER E - Powerplant - General	Repair only
		Powerplant Fire Protection	Repair only
527	1191	Firewalls	Repair only
527	1193	Cowling and engine compartment covering.	
527	1194	Other surfaces	
		SUBCHAPTER F - Equipment - General	
527	1301	Function and installation.	
527	1307	Miscellaneous equipment	
527	1309	Equipment, systems & installations	
527	1321	Arrangement and visibility	Limited to:
527	1322	Warning, caution & advisory lights	
		Electrical Systems and Equipment	Non-required equip.
527	1351	General	
527	1357	Circuit protection devices	Non-complex avionics
527	1361	Master switch arrangement	
527	1365	Electrical cables and equipment	Non-integrated avionics
527	1367	Switches	
		Lights	
527	1381	Instrument lights	
		Safety Equipment	
527	1411	General	
527	1413	Safety belts	
		SUBCHAPTER G - Operating Limitations and Information	
527	1529	Instructions for continued airworthiness	
		Markings and Placards	
527	1557	Miscellaneous markings and placards	
		Rotorcraft Flight Manual and Approved Manual Material	
527	1589 (a)	Loading information	
End of AWM 527			

AWM 529, Normal Category Rotorcraft			
CHAPTER	REQUIREMENT	PARAGRAPH TITLE	EXCEPTIONS
		SUBCHAPTER A - GENERAL	
529	1	Applicability.	
529	2	Special Retroactive Requirements	
		SUBCHAPTER B - FLIGHT - GENERAL	
529	29	Empty weight and corresponding center of gravity.	
		SUBCHAPTER C - STRENGTH REQUIREMENTS - GENERAL	
529	303	Factor of safety.	
529	305(a)(b)(1)	Strength and deformation.	
529	307 (a)(b)(2)	Proof of structure	
		Flight Loads	
529	337 (a)	Limit manoeuvring load factor	
		Emergency Landing Conditions	
529	561	General	
		SUBCHAPTER D - DESIGN AND CONSTRUCTION - GENERAL	
529	601	Design	
529	603 (a)	Materials.	
529	605 (a)	Fabrication methods.	
529	607	Fasteners.	
529	609	Protection of structure.	

AWM 529, Normal Category Rotorcraft			
CHAPTER	REQUIREMENT	PARAGRAPH TITLE	EXCEPTIONS
529	611	Inspection provisions.	
529	613	Material strength properties and design values.	
529	619	Special factors.	
529	621	Casting factors.	
529	623	Bearing factors.	
529	625	Fitting factors.	
		Personnel and Cargo Accommodations	
529	785	Seats, berths, litters, safety belts, and harnesses.	
529	787	Cargo and baggage compartments.	
529	831 (a)	Ventilation	
		Fire Protection	
529	851	Fire Extinguishers	
529	853	Compartment interiors.	
529	855	Cargo and baggage compartments.	
		External Loads	
529	865 (a) – (e)	External loads	
		SUBCHAPTER E - Powerplant - General	
		Powerplant Fire Protection	
529	1191	Firewalls	
529	1193	Cowling and engine compartment covering.	
529	1194	Other surfaces	
		SUBCHAPTER F - Equipment - General	
529	1301	Function and installation.	NOT DELEGATED
529	1307	Miscellaneous equipment	
529	1309	Equipment, systems & installations	
529	1321	Arrangement and visibility	
529	1322	Warning, caution & advisory lights	
		Electrical Systems and Equipment	
529	1351	General	
529	1353 (a) (b)	Electrical equipment and installations	
529	1355 (a)	Distribution system	
529	1357 (except b)	Circuit protection devices	
529	1359	Electrical system fire and smoke protection	
		Lights	
529	1381	Instrument lights	
		SUBCHAPTER G - Operating Limitations and Information	
529	1529	Instructions for continued airworthiness	
		Markings and Placards	
529	1557	Miscellaneous markings and placards	
		Rotorcraft Flight Manual and Approved Manual Material	
529	1589 (a)	Loading information	
End of AWM 529			

AWM 533, Aircraft Engines			
CHAPTER	REQUIREMENT	PARAGRAPH TITLE	EXCEPTIONS
		Subchapter A General	Repair only
533	1	Applicability	Repair only
533	3	General	Repair only
533	4	Instructions for Continued Airworthiness	
533	5	Instruction Manual for Installing and Operating the Engine	
		Subchapter B Design & Construction : General	
533	11	Applicability	
533	15	Materials	
533	23	Engine Mounting Attachments and Structure	
End of AWM 533			

AWM 551, Aircraft Equipment and Installation			
CHAPTER	REQUIREMENT	PARAGRAPH TITLE	EXCEPTIONS
551	100 (d)	Flight Data Recorder	Structural aspects only
551	101 (d)	Cockpit Voice Recorder	Structural aspects only
551	104 (f) (1) (2) (3)	Emergency Locator Transmitter	
551	400	Hand-Held Fire Extinguisher	
551	406	Seat Belt and Shoulder Harness	
End of AWM 551			

APPENDIX D: Letter of Authorization



Transport Canada Transports Canada

Ottawa, Ontario
K1A 0N8

Rec'd
MAR 10 2014
[Signature]

Your file/Votre référence

Our file/Notre référence
5010-3-00304 (TAH)
RDIMS 9147058

MAR 03 2014

Mr. James Tinson
8731 Allison Street
Richmond, BC
V6Y 3H9

Subject: Revised Letter of Authorization — Design Approval Representative (DAR) #304

Dear Mr. Tinson:

Transport Canada Civil Aviation (TCCA) has reviewed the change in your Scope of Authorization as a DAR. We are pleased to inform you that you continue to meet the requirements of Subchapter C of Chapter 505 of the Airworthiness Manual (AWM). Pursuant to Section 4.3(1) of the *Aeronautics Act*, you are hereby authorized to continue to perform the authorized functions within the scope of your authorization as a DAR on behalf of the Minister of Transport. This letter supersedes your current Letter of Authorization.

If this change in authorization affects the Engineering Procedural Manual (EPM), you are requested to revise the EPM and have it approved by the Technical Team Lead, Engineering.

This change is effective March 3, 2014 and remains in effect subject to section 505.225 of the AWM and while you continue to meet the conditions of authorization.

Conditions of Authorization

As a DAR, you are required to:

- Operate within the Scope of Authorization as defined in Appendix 'A' of this letter;
- Comply with the regulations, regulatory standards and guidance material approved or accepted by the Minister;
- Comply with the latest revision of your TCCA approved EPM;
- Maintain a current knowledge of regulations, regulatory standards and advisory material accepted by the Minister and maintain competence and proficiency in your area of expertise, in accordance with section 505.203 of the AWM;

.../2

[Signature]

Canada

APPENDIX D: Letter of Authorization, continued

- 2 -

- Use an interpretation of the regulatory standards that is acceptable to TCCA when making a Finding of Compliance (FOC);
- Review the applicant's data, make any engineering inspection or assessment and conduct or witness any test necessary to verify that the data is correct and is sufficient to enable you to determine compliance with the applicable standards of airworthiness;
- Make FOC against all applicable regulatory standards within your Scope of Authority using accepted methods prior to issuing an approval;
- Ensure that; specified TCCA Level of Involvement (LOI) is complete before issuing an approval, where TCCA establishes an LOI;
- Record your signature and delegate number DAR 304 when exercising this authorized function; and
- Issue a serialized Supplementary Type Certificate and/or Repair Design Approval.

Failure to meet the conditions of authorization may result in suspension of privileges.

Additional Information

Current advisory and guidance material may be found on the Transport Canada website:

<http://www.tc.gc.ca/eng/civilaviation/opssvs/managementservices-referencecentre-menu-113.htm>

Questions regarding these documents may be directed to the Policy Standards Coordinator (AARTC):

Phone: 613-990-6924
Facsimile: 613-952-3298
E-mail: AARTC@tc.gc.ca

In the event that you become inactive, notify TCCA and return your Letter of Authorization to Technical Team Lead, Engineering (TTLE) within seven days.

Mr. Jorge Canal, Regional Engineer is available for all consultation. He can be reached at 604-666-6884, and you should communicate with him regularly when fulfilling your authorized function.

.../3

2/4/14

APPENDIX D: Letter of Authorization, continued

- 3 -

You shall acknowledge both receipt of this letter, and your acceptance of these conditions by completing the confirmation block and returning a complete copy of this letter within fifteen days of receipt of this letter to:

Robert Metz, TAHI
Acting Technical Team Lead, Engineering
Aircraft Certification, Pacific Region
800 Burrard Street
Vancouver, BC
V6Z 2J8

Yours truly,



J. David Turnbull
Director, National Aircraft Certification
for the Minister of Transport

Attachment: Appendix 'A'

Letter of Authorization Confirmation

I understand and accept the responsibilities, conditions and limitations associated with this delegation of authority, defined by this letter and the referenced EPM, as DAR 304

Mr. James Tinson

Signature

Date

15 March
2014

3/4/14

APPENDIX D: Letter of Authorization, continued

Appendix 'A'

James Tinson – DAR #304
Specialty: General, Powerplants and Structures

SCOPE OF AUTHORIZATION:

Specialty

- General, Powerplants and Structures, as defined in the TCCA approved EPM

Authorized Functions

- Make a FOC against relevant sections of the AWM 523, 525, 527, 529 or sections referenced in the EPM subject to the limitations defined in this appendix.
- Approve type design changes according to the scope defined in the EPM.
- Issue serialized Supplemental Type Certificates.
- Issue Repair Design Approvals.

Aeronautical Products

- Applicable to the aeronautical products defined in the EPM.

General Limitations

- Perform authorized functions in accordance with the general limitations described in the EPM.

Additional Limitations

- None.

4/14/14
JL

BHT-212-IPB

Bell Helicopter
 A Textron Company

Eye bolt 25 AN43B4A

Clevis 27

MS27975-4

Nut 28

AN316-4

Rod 29
end

AN 490HT6

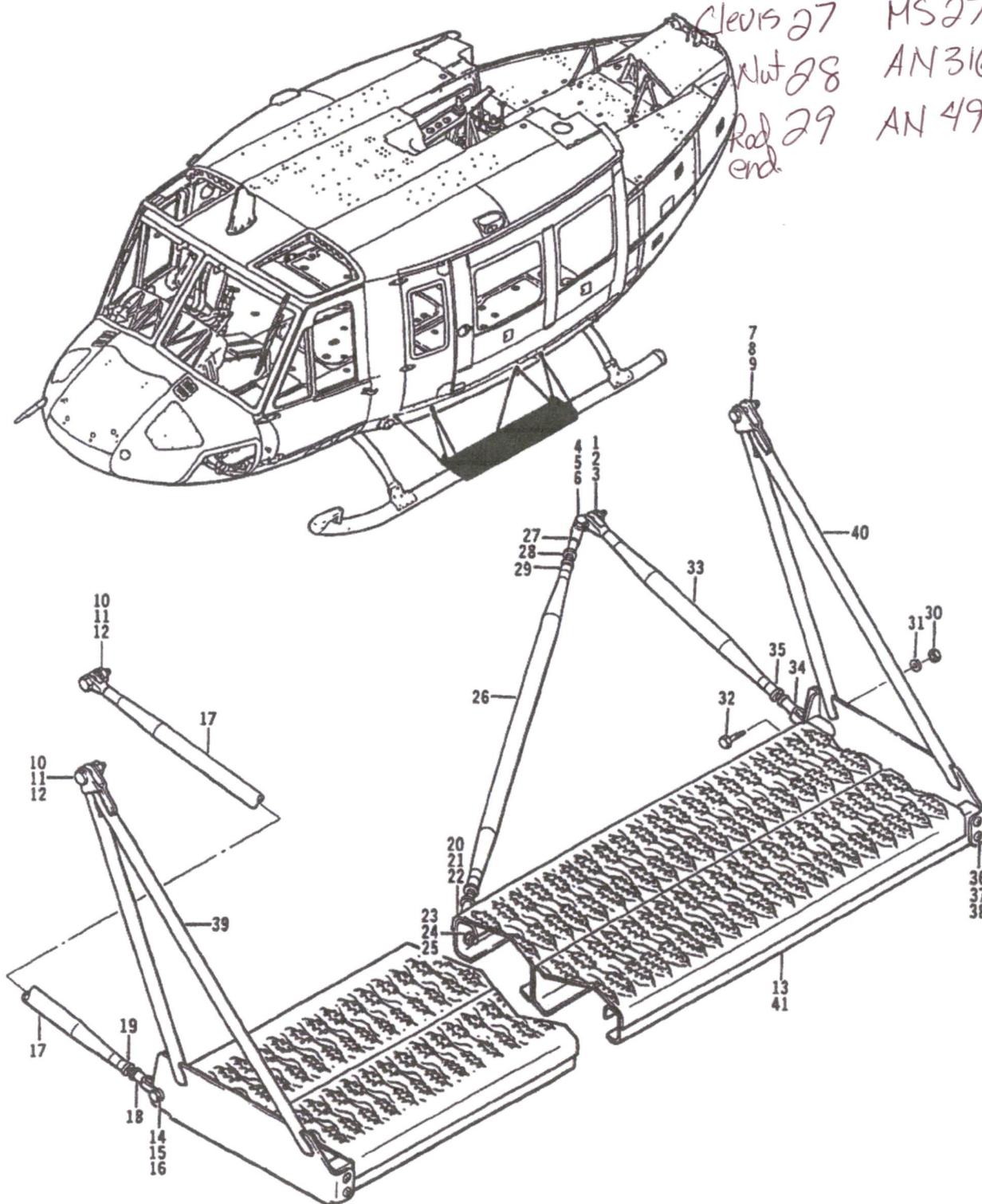
212-32-1006
C0000

Figure 32-15. Fixed Step Kit

32-99-00

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Rev. 8 30 APR 2010

BUY BELL PARTS, BUY BELL VALUE

ECCN EAR99

1	AN3-6A	BOLT	1	SP
1	MS21042L4	NUT	1	SP
1	AN960PD416	WASHER (REPLACED BY AN960JD416)	1	P
1	AN960JD416	WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	1	P
1	NAS1149D0463J	WASHER (REPLACES AN960JD416)	1	SP
1	AN43B4A	EYEBOLT (REPLACED BY AN43B-4A)	1	NP
1	AN43B-4A	EYEBOLT (REPLACES AN43B4A)	1	SP
1	212-030-615-005	STRUT ASSY	1	P
2	MS27975-4	CLEVIS	2	SP
2	AN316-4	NUT (REPLACED BY AN316-4R)	2	NP
2	AN316-4R	NUT (REPLACES AN316-4)	2	SP
2	AN490HT6	ROD END	2	NP
1	MS21042L3	NUT, SELF-LOCKING	1	SP
1	AN960PD10	WASHER (REPLACED BY AN960JD10)	1	P
1	AN960JD10	WASHER (REPLACES AN960PD10) (REPLACED BY NAS1149D0363J)	1	NP
1	NAS1149D0363J	WASHER (REPLACES AN960JD10)	1	SP
1	AN3-6A	BOLT	1	SP
1	212-030-615-001	STRUT ASSY	1	SP
1	MS27975-4	CLEVIS	1	SP
1	AN490HT6	ROD END	1	NP
16	MS21042L3	NUT, SELF-LOCKING	16	SP
16	AN960JD10L	WASHER, FLAT (REPLACED BY NAS1149D0332J)	16	NP
16	NAS1149D0332J	WASHER, FLAT (REPLACES AN960JD10L)	16	SP
16	MS27039-1-09	SCREW	16	SP
1	212-030-617-003	SUPPORT ASSY , LH	1	P
1	212-030-617-004	SUPPORT ASSY , RH	1	SP
1	212-030-617-001	SUPPORT ASSY , LH	1	P
1	212-030-617-002	SUPPORT ASSY , RH	1	P
1	212-030-619-001	STEP ASSY	1	P

Availability Code Definition

Procurable NP = Non Procurable SP = Normal Stock / Procurable

Part Number	Nomenclature	UPA	Avail.	UOC
212-706-057-001	FIXED STEP KIT , LH	1	SP	
212-706-057-002	FIXED STEP KIT , RH	1	SP	
MS21042L4	NUT	1	SP	
AN960PD416	WASHER (REPLACED BY AN960JD416)	1	P	
AN960JD416	WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	1	P	
NAS1149D0463J	WASHER (REPLACES AN960JD416)	1	SP	
AN43B-10A	EYEBOLT	1	SP	
MS21042L3	NUT, SELF-LOCKING	1	SP	
AN960PD10	WASHER (REPLACED BY AN960JD10)	1	P	
AN960JD10	WASHER (REPLACES AN960PD10) (REPLACED BY NAS1149D0363J)	1	NP	
NAS1149D0363J	WASHER (REPLACES AN960JD10)	1	SP	
AN3-6A	BOLT	1	SP	
MS21042L4	NUT	1	SP	
AN960PD416	WASHER (REPLACED BY AN960JD416)	1	P	
AN960JD416	WASHER (REPLACES AN960PD416) (REPLACED BY NAS1149D0463J)	1	P	
NAS1149D0463J	WASHER (REPLACES AN960JD416)	1	SP	
AN4-10A	BOLT	1	SP	
AN960PD516	WASHER (REPLACED BY AN960JD516)	2	NP	
AN960JD516	WASHER, FLAT (REPLACES AN960PD516) (REPLACED BY NAS1149D0563J)	2	NP	
NAS1149D0563J	WASHER (REPLACES AN960JD516)	2	SP	
AN5-10A	BOLT	2	SP	
212-030-616-001	STEP ASSY , LH	1	P	
212-030-616-002	STEP ASSY , RH	1	P	
MS21042L3	NUT, SELF-LOCKING	1	SP	
AN960PD10	WASHER (REPLACED BY AN960JD10)	1	P	
AN960JD10	WASHER (REPLACES AN960PD10) (REPLACED BY NAS1149D0363J)	1	NP	
NAS1149D0363J	WASHER (REPLACES AN960JD10)	1	SP	
AN3-6A	BOLT	1	SP	
212-030-615-003	STRUT ASSY	1	P	
MS27975-4	CLEVIS	1	SP	
AN490HT6	ROD END	1	NP	
MS21042L3	NUT, SELF-LOCKING	1	SP	
AN960PD10	WASHER (REPLACED BY AN960JD10)	1	P	